COAL AGE

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The First-Aid King

RECENTLY, a "Safety First" week was set apart in one of our great cities and men from all trades, industries and crafts participated. One evening was featured by first-aid drills by the city police, firemen and boy scouts. This first-aid exhibition by the policemen and firemen—with no thought of discredit to these earnest and efficient men—seemed both humorous and pathetic to those present who had witnessed scores of first-aid meets held by coal miners. The rough and ready manner in which the policemen applied their dressings and handled their patient elicited exclamations of surprise from the mining men who were present.

Why? Simply because it had time after time been the good fortune of these same mining men to witness first-aid teams of coal miners—big, brawny, hard-fisted men—to see them bandage and handle their patient with all the care and gentleness of expert trained nurses!

Our average English-speaking coal miner is a natural-born "first-aid man." Behind him are decades of effort in the inky blackness of the mine—skilling his hand to move surely and deftly in the semi-darkness of the "working face," and training limb and muscle to move to greatest advantage in limited and confined space where every inch counts.

The ever present menace of "firedamp," "blackdamp," "mine fire," and "roof fall"—all lurking somewhere in the darkness of the "pit"—have combined to school the coal miner into a man ready for any emergency, and to mold his craft into the closest brotherhood to be found in all our industrial world! The direful blast of every mine explosion is a clarion call to scores of common, work-a-day miners, who risk their lives with calm heroism in the task of rescuing their fellow miners.

Our nation has not awakened to the pre-eminent superiority that the coal miner has attained in this great first-aid-to-the-injured movement. A nation-wide contest open to picked teams representing all trades and industries will demonstrate this to the general public.

Our sturdy coal miner will then step forth single-handed and alone and—like Macauley's Horatius at the bridge—he will more than hold his own against the chosen sons of mill, foundry, shop, railway, city, army and navy. The fact is not generally known that we now have in this country over fifty thousand coal miners trained in first-aid work—partly owing to the untiring efforts of the Federal Bureau of Mines, and the enthusiastic coöperation of mine owners everywhere.

Let us then allot full credit to the coal miner for his magnificent work in forwarding the cause of first-aid-to-the-injured, which has today spread to every hamlet throughout this country. For "First Aid" is one platform plank upon which we all agree—Democrats, Republicans, Prohibitionists and Socialists. It is the one clause in the "joint agreement" upon which miner and operator clasp the good right hand of fellowship. Let us hope, then, that through the broad principle of humanity that the first-aid movement represents, it may prove to be the early dawn of the "Better Day"—and one step closer to the Brotherhood of Man.

By H. D. MASON, Jr., *Mine Safety Engineer, Pittsburgh, Penn.*

Ideas and Suggestions

Advantages of Technical Writing

By A Contributor

There are not many side energies open to mining men that are more educative than technical writing. Writing is better than merely reading. The difference is the difference between constructive thought and the passivity with which you accept the efforts of others. Through writing not only do you in time acquire a fluent and comprehensive grasp of language—an attainment that everywhere commands respect but—best and greatest advantage of all—you are also compelled to study and to be continually studying any subject you may be expressing your ideas on, in order that your work may be worth reading in its turn.

Most mining districts contain many men who are rather contemptuous of the man who tries this work. Their grounds for grumbling appear to be mainly a dislike for writing as writing, inability to admit that another man has more ideas than they themselves, and the stupidity of a writer giving away his knowledge. The first two reasons, if they can be called reasons, represent just jealousy; but the latter indicates a rather low condition of mental ability. Do these men ever stop to consider how much they owe to someone's written ideas embodied in the books they have read? Without the propagation of knowledge mining would be a backward industry, one that would be at a standstill, and it should be the duty of all those who can in any way do so to counteract that tendency. Besides that, there is little of the "giving away of information" about writing. There is little added to mining thought and literature in any one year that can be claimed as absolutely new. Most of the material that appears is already ancient history, but returns dressed in fresh fashion. There are hundreds of subjects that will bear this redressing because they are constantly recurring in mining life and need to be continually impressed upon our minds.

But technical writing is a greater educator to the writer himself than it is to any one of his readers. Try your hand at writing a technical article on any subject with which you flatter yourself you are well acquainted. The first shock you will receive will be that in reality you know little about what you thought to write on. The paucity of one's knowledge is soon apparent when put on paper. It is like schooldays over again, when you faced an examination on which you were ill prepared. You will discover that you know certain things happen and continue to happen, but you cannot explain the reasons for their doing so. At this point, if "you are worth your salt," you will resolve to really get to know about that particular subject; and here a second slap in the face awaits you, for you will then learn how far behind you have fallen in the acquisition of information about your profession. You will see that hosts of other writers have taken the subject up and treated it scientifically from beginning to end as far as present knowledge will allow. It is humiliating to find that while you have been dreaming the days away, others have passed you years ago and have taken the subject to realms you feel you can never reach.

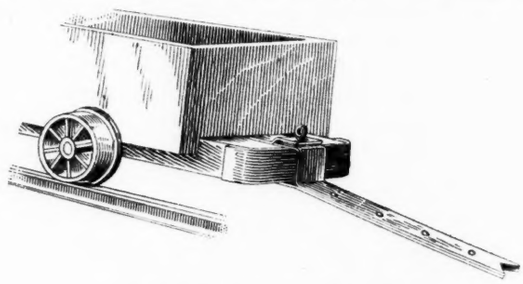
But after that humiliating period has passed, you will again begin to delight in your work, because you have again been taught to think—taught to think constructively, to think ahead, to plan and organize. Gradually, too, you will find that you are particularly interested in some special branch of mining, and as your knowledge grows so too will your interest. In this way you will become wiser and your contemporaries will soon recognize the fact that you have become an expert upon those subjects. Best of all, you will have the satisfaction of knowing that you are helping in the greatly needed work of educating mining men and disseminating knowledge. If everyone were alive to this aspect of the case, there would be less loss of life, more conservation of minable areas, less loss of capital, and fewer failures made of men.

Why not try and join in this great movement? All can help in some way. If it is not too late to make a suggestion, I would advance the idea that *Coal Age* form a club of those who have contributed to its pages and in doing so helped to raise a higher standard of industry through the imparting of knowledge.

A Good "Dog"

By R. Z. Virgin*

In a recent issue of *Coal Age* I saw a drawing of a torch for the rear ends of locomotive trips. This torch was made from pipe and pipe fittings. I have had some



THE "DOG" ATTACHED TO CAR

of these torches made and find them to be a great improvement over torches with which we had formerly been working.

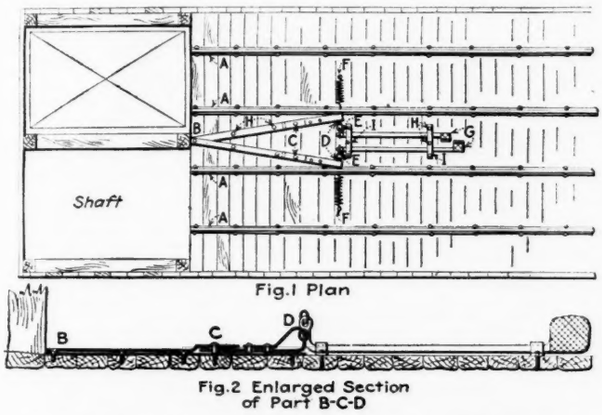
At our mine we had been employing "drags" or "dogs" for derailers on the rear ends. Some patterns turned sideways and slid back in front of the cars, while others broke the drawbar off or bent it so that it could not be coupled again. Much relief was experienced through the adoption of the design shown in the accompanying illustration, which needs no explanation.

*Wheeling Steel and Iron Co., Wheeling, W. Va.

Useful Safety Catch

By W. H. Luxton*

The following is a description of the arrangement of a safety catch employed in the Sunflower Mine, Dugger, Ind. It is used to prevent cars from running into the shaft sump. This device is simple in construction and easy to manipulate. Fig. 1 is a plan of the arrangement. The parts *B-D* are made of iron 1 in. thick and about 4½ in. wide. The end *B* is placed against the center upright of the shaft, the other end *D* resting beside the track rail *A* and extending above it about 6 in. When not being held off the rail by the cager putting his foot on the lever *G* to allow cars to pass onto the cage, the catch is always held in position ready for action by means



FIGS. 1 AND 2. DETAILS OF THE SAFETY CATCH

of a spring, similar in arrangement to spring latches or switches, the spring being fastened in the middle of the track at the point *F*.

The catch, or chock, end of this arrangement catches the outer edge of the car wheel, and thus if the force is sufficient (as in the case of a runaway) throws the car from the track. The car wheels generally extend over the outer edge of the steel rails as much as 2 in., which is sufficient to allow the catch to rest just beside the rail and engage the protruding part of the wheel.

The levers *E* and *G* are made of a piece of round iron, 1½ in. in diameter. The end *E* is about 4 in. long and is maintained in a vertical position by a chain link connecting it with catch *D*. The other end of lever *G* is about 6 in. long and makes an angle with the floor of about 45 deg., pointing away from the track on which it operates the safety catch, or chock.

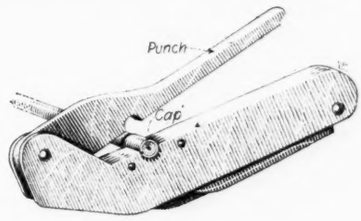
The distance from *E* to *G* is about 4 ft.; thus when the car is resting against the catch and the cager gets in position to place the car on the cage, he puts his foot on the lever *G* and presses it to the floor. This turns the bar and the lever *E* sufficiently to withdraw the catch from in front of the wheel. The lever *G* acts as a foothold until the rear wheels of the car are past the catch. The floor at this point is made of plank about 4 in. thick and 10 to 12 in. wide laid side by side. The catch pivots on the bolt *C* about 18 in. from the chock *D*.

This safety catch is simple, practical and quite inexpensive. It can be installed by any experienced mine engineer or superintendent and will fill the bill satisfactorily if the conditions call for any such arrangement.

*Linton, Ind.

A Crimping Knife

A recent U. S. patent (No. 1,184,746) granted to Ole Hanson, of Lead, S. D., covers an ingenious variation of the ordinary jack-knife. A hinged arm on the back has its end sharpened to act as a punch. Near the pivot

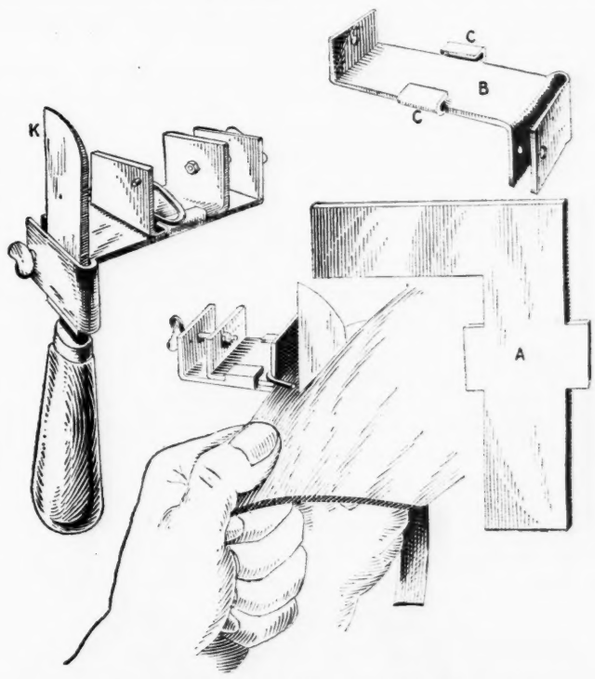


A CRIMPING KNIFE

is a semicircular recess cut partly in the back of the knife and partly in the arm. This recess holds the cap and crimps it on the fuse. This device is recommended to miners as being much safer than the time-honored method of crimping with the teeth

Gage for Splitting Belt Lace

A simple device for a gage for splitting belt lace is made of heavy sheet brass or iron into the shape shown at *A* and bent as shown at *B*. The short extension *C* is turned over to form a groove for the slide, as shown assembled. The adjusting screw holds the slide in posi-



GAGE TO CUT BELT LACE TO UNIFORM WIDTH

tion for the width of lace required. A small spring wire is bent and fastened to the slide with the end extending over the lace, as shown, and keeps the lace level on the gage. This little contrivance is placed on the blade of an ordinary jack-knife *K* and clamped. The whole thing is only 1¾ in. long and ½ in. wide. It is easily made and serves the purpose as well as an expensive gage, which is seldom provided.—J. O. McDonnell in *Power*.

Methods of Mining in the Anthracite Field--IV

By H. M. Crankshaw*

SYNOPSIS—In the folds of the Mammoth bed timbering is difficult. This is particularly true in ground which has already been worked over and is consequently more or less loose. Decay is the principal agency tending to destroy mine timbers. Although many processes have been tried to prevent rapid rotting, the surest method of forestalling it is to use steel timber.

Where the Mammoth coal bed is over 40 ft. thick and is mined as a pitching bed, there have been instances of the use of timber which are probably without parallel in the history of mining the world over. The Mammoth bed, in some cases, folds until at the widest part of the convolution there is a total thickness of from 200 to 300 ft.

Several years ago, gangways were driven in the center of this body of coal with the result that after trying for years at great cost to keep such gangways open the expense finally became prohibitive and these passages had to be abandoned. Even where the bed was 60 ft. thick, in some cases, as many as 12 squads of men (12 miners and 12 laborers) were required to keep open one gangway less than 4,000 ft. long.

The modern tendency has been to replace gangways in the Mammoth bed, wherever possible, by driving passages in thinner underlying beds; and where such gangways must be driven and kept open for a period of years, to put in some permanent type of timbering, such as steel.

To give some idea of how these old timbered gangways were on the move, it has been estimated that 52 ft. of bottom were taken up in one gangway over a period of 12 yr.; that is to say, every three months the bottom heaved over 1 ft. The upkeep of a gangway under these conditions can better be imagined than described, but the feature which stands out with greatest prominence in this work is that it was imagined that heavy timber was what was needed to maintain such gangways. Accordingly, timber 24 and even 36 in. in diameter was employed.

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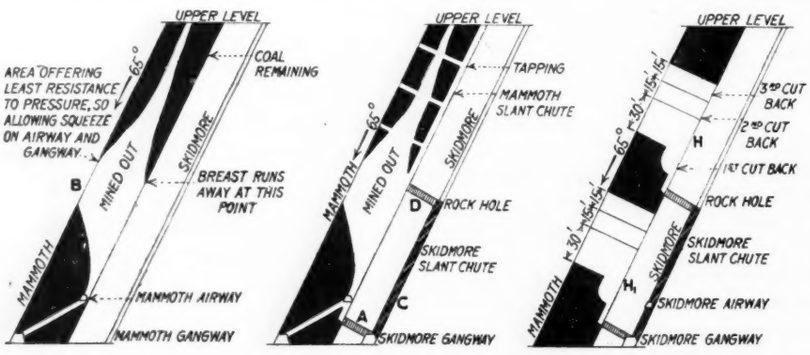


FIGS. 26, 27 AND 28. METHODS OF WORKING THE STEEPLY INCLINED MAMMOTH BED

In order, therefore, to avoid the expensive upkeep of Mammoth-bed gangways as main haulageways, the general method is to drive these passages in the Skidmore or some other underlying bed. In some cases, however, a gangway in an overlying bed such as the Primrose is used as a main haulageway.

Fig. 26 gives an idea of how the pressure and general squeeze is brought on gangways in the Mammoth bed,

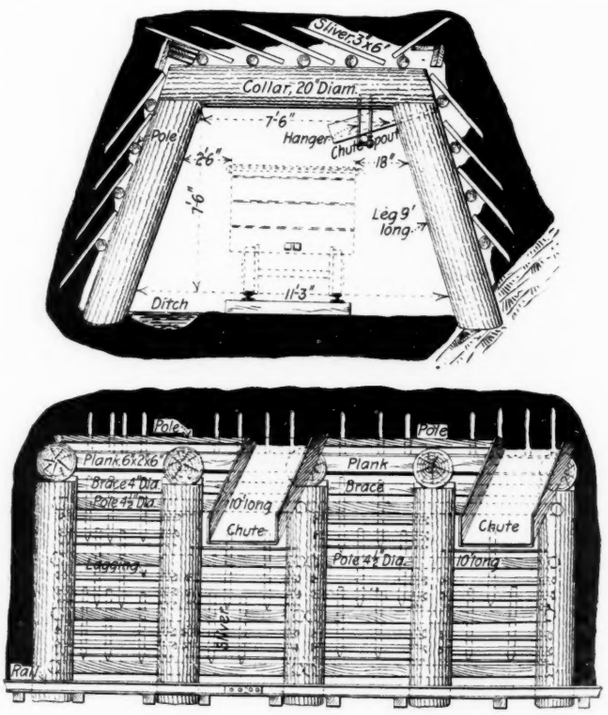


FIG. 29. TYPICAL GANGWAY TIMBERING

especially when a breast is started near the bottom of the lift. This diagram shows only average conditions where the bed is 30 to 60 ft. thick.

When the breast has been run empty and the pillars cut, the greatest amount of coal has been extracted near the bottom of the lift; consequently, the ground tends to break where the resistance is least, or at the point *B*, Fig. 26. The ground is often not able to break with a clean fracture and so relieve the pressure; consequently, a squeeze is thrown on the airway and gangway which has a continuous action, causing the floor of the gangway to heave and the timber to break as fast as it is put in, while the maintenance of the airway is difficult. The next step was to drive a gangway in the Skidmore bed, Fig. 27, and start the breasts from the bottom of the lift at a point near the top of the rock chute *A*. This, however, did not solve the problem of mining

the coal near the top of the lift, so in order to get a good extraction, it was necessary to drive a slant chute *C* in the Skidmore bed and put through a second rock hole *D* for the purpose of winning the top coal. As the top coal had already been partly worked and had to be

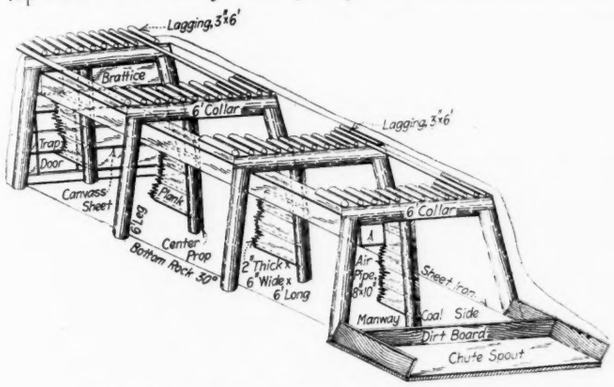


FIG. 30. METHOD OF TIMBERING CHUTE

remined by means of chutes, this method was not satisfactory, owing partly to the amount of timber used in the chutes and partly to the crushed condition of the coal recovered.

Consequently, the method shown by Fig. 28 was finally adopted for use where the bed was virgin. In this method the upper half of the lift was mined first by the breast method (*H*, Fig. 28), and then after the pillars in the upper half had been robbed, the lower half was worked in the same way (H_1 Fig. 28). Thus the whole lift was mined out with a minimum use of timber, a maximum extraction and a high percentage of prepared sizes.

Fig. 29 gives a typical example of timbering a gangway in the Mammoth bed. Where the ground is at all soft or liable to run, forepoling is invariably resorted to. When driving in solid ground the miner generally excavates ahead and then places the poles in position so as to prevent a fall or rush of coal.

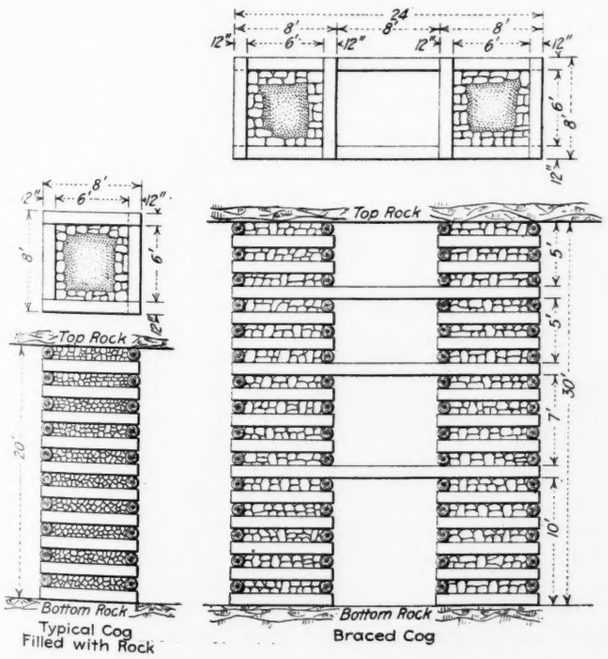


FIG. 31. COGS FOR THICK BEDS

When driving through a fall or broken ground, however, it is necessary to use poles 16 to 18 ft. long and drive them ahead, using a force of men and a heavy ram. In work of this character it takes expert men three shifts to put up one set of timber; and miners who are not accustomed to the work might not get one set up in a week, with little chance of getting through an extensive fall—except at enormous expense.

In addition to poles, lagging and slivers are employed, as can be seen by referring to Fig. 29. In some cases where the ground is very dry and soft, a hole the size of a man's hand will allow enough coal to run through to fill the gangway. Instances of this kind, while not the rule, are by no means uncommon; and invariably in gangways in the Mammoth bed poles and lagging are used.

Fig. 30 gives an example of a typical chute in the Mammoth bed. In going through soft ground, poles and forepoling must be resorted to; it being necessary where the ground is bad to drive forepoles ahead as in the gangway; and in some cases it is necessary also to forepole on the sides of the chute.

The chute is driven with a travelingway on one side. This is also used for carrying up plank and timber. The manway or travelingway is kept separate from the coal side by putting a center prop in the chute to which planks are nailed, as a general rule; the bottom of the coal chute is then covered with sheet iron. Sometimes, however, the pitch is made heavy enough so that sheet iron is not needed.

For purposes of ventilation in driving chutes, a line of ventilating or air pipe is run up the manway side 8x10 in. (inside measurements) and connected to a fan suitably located.

It is astonishing what difficult ground can be traversed by chutes of this description when experienced men are employed. When reopening ground which has already been mined, soft spots and caved ground, which consist entirely of large rocks, can be successfully passed in order to reach coal which would seem to be inaccessible.

Other pitching beds, such as the Orchard, Primrose and Buck Mountain, are timbered after the same style as the Mammoth, but lighter timber can be employed, it being possible to use 10-in. sticks for legs in many cases. In fact the general tendency during the past few years has been to decrease the size of gangway timber in all beds.

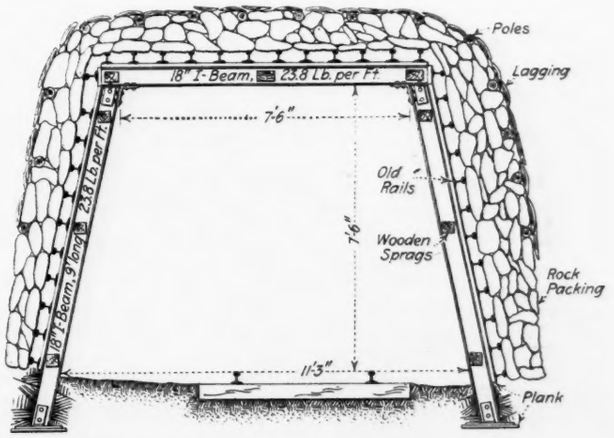


FIG. 32. STEEL GANGWAY TIMBERING

FIG. 33. A SURFACE TIMBER STORAGE PLANT

FIG. 34. STEEL GANGWAY TIMBERING ON A CURVE

Fig. 31 is an example of large cogs used where the coal bed is not highly inclined. When the bed is over 20 ft. thick, it is common practice to brace two cogs together by means of long poles built into each cog. This keeps the cogs from bulging and enables a load to be carried by two small cogs which would otherwise need a large and expensive single cog.

The Decay of Mine Timber

It has been estimated by authorities on this subject that 50 per cent. of the wastage of timber in the mines of the United States is due to decay and insects; and of this 50 per cent., the greater wastage is due to decay. The decay of wood, in the majority of cases, is caused by wood-destroying fungi. The wood is, first of all, infected either by microscopic spores being carried by the air, or by the fungus itself spreading from timber already infected. In either case fungal threads entering from the outside penetrate and gradually destroy the wood.

According to their mode of growth, wood-destroying fungi may be classified in two types. One type gradually grows within the wood and also emits threads that emerge from the wood and grow rapidly over the surface. By means of the string-like growths which often emanate from the fungus it has been known to pass over dirt, stones, coal, and even through brick walls which were not absolutely tight, infecting timber several yards away.

The other type of fungus, having entered the wood, advances more slowly, gradually eating its way into the center of the timber and leaving an apparently sound shell on the outside.

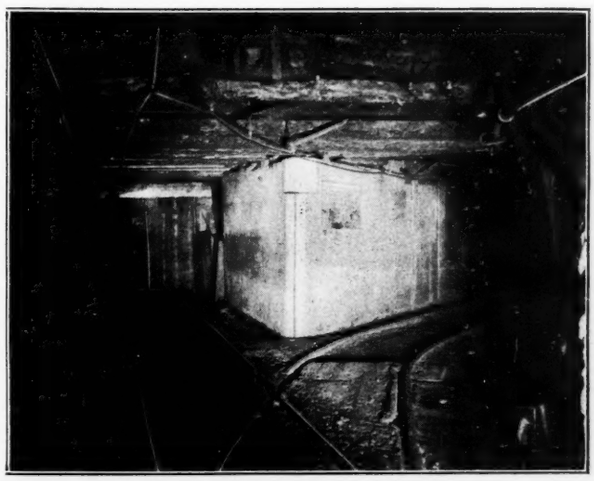


FIG. 35. CONCRETE PIER HEAD CARRYING STEEL BEAMS

For the purposes of respiration, fungi require an adequate amount of oxygen and moisture. It is therefore evident that one of the best methods of preventing decay is to keep timber either very wet or very dry. If the timber is kept wet, the fungus does not thrive because it cannot secure an adequate supply of oxygen; and if the timber is dry, the fungus does not thrive because it cannot secure an adequate supply of moisture. Extremely wet or dry conditions, therefore, do not allow most of the fungi generally found in mines to thrive.

It is not possible in this paper to discuss the many methods which have been tried to preserve mine

FIG. 36. STEEL TIMBERS ERECTED TO ROCK READY TO START TUNNEL

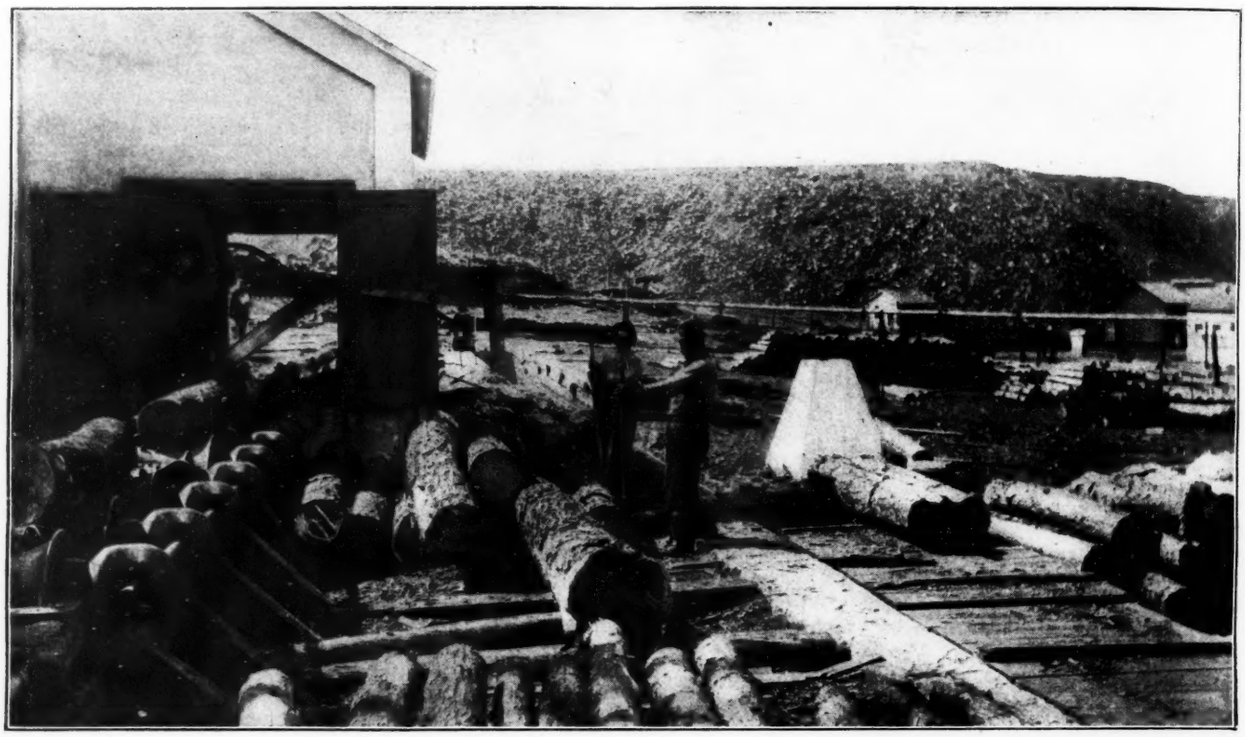


FIG. 37. HANDLING AND SAWING TIMBER ON THE SURFACE

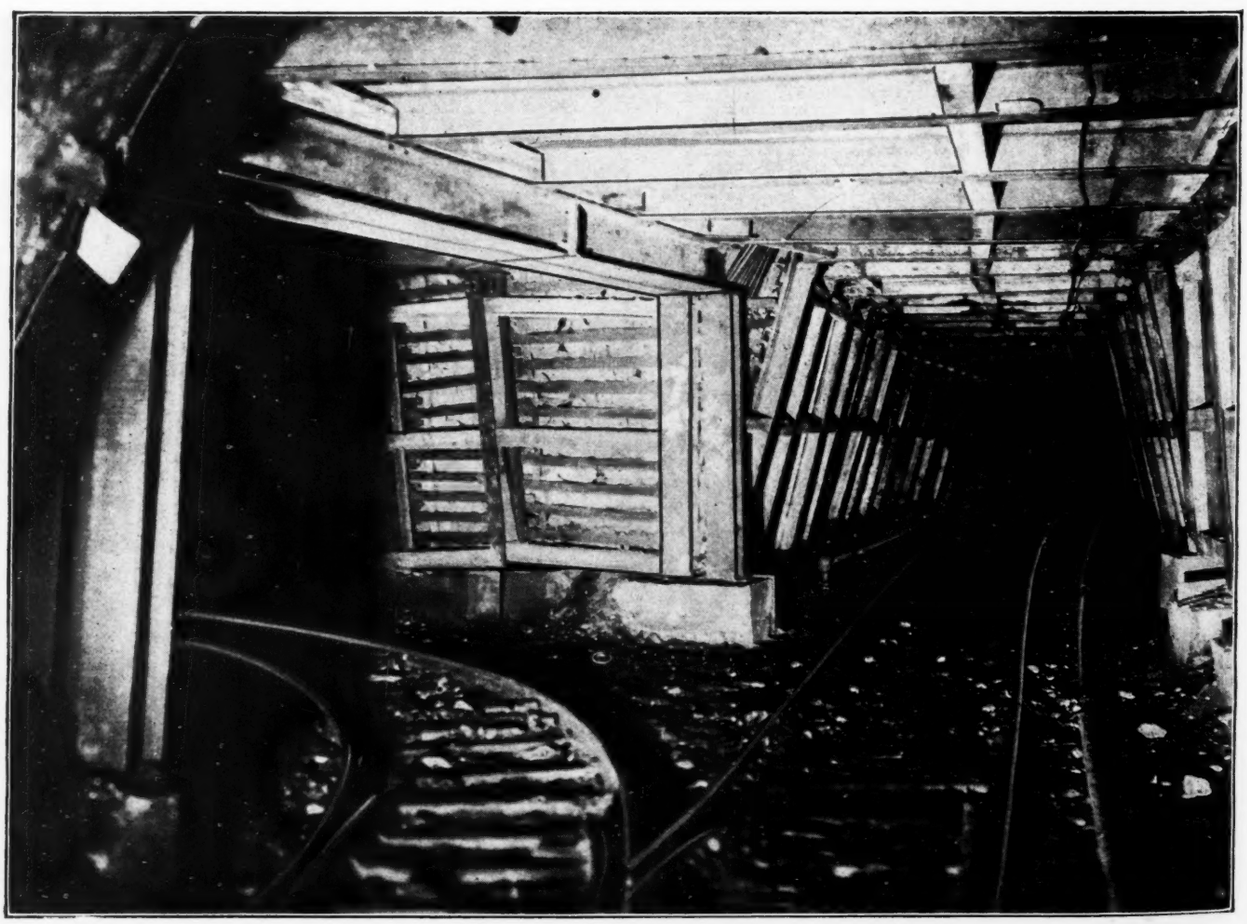


FIG. 38. STEEL TIMBERING ON CURVE OFF MAIN GANGWAY

timbers; but the most typical are: (1) Seasoning; (2) carbonizing, or burning the outside; (3) painting; (4) immersion in a hot tank of antiseptic solution; (5) impregnation with creosote, or other substance, under pressure.

Of all these methods, painting, immersing or impregnating with creosote are the most satisfactory; but in mines where the fire risk is great this cannot be recommended.

Iron sulphate, copper sulphate and zinc chloride have been used for antiseptic solutions, the strengths being approximately 5 per cent. iron sulphate, 10 per cent. copper sulphate and 10 per cent. zinc chloride. The usual time of immersion is 12 hr.

However, where mining conditions are such that timber rots rapidly, unless market conditions are such as to make the price of steel prohibitive, it pays to put in steel timber.

Fig. 32 is an example of how to erect a set of steel timber so that the pressure may be equally distributed over the whole set. Plank is put under the legs, along the legs and on the collar. On the plank old scrap rails are spaced and all cavities between the rails and coal filled with rock, which can generally be obtained from some rock tunnel in process of driving.

Fig. 34 shows a curve in a main haulageway completely timbered with steel as per Fig. 32. Fig. 36 shows steel timbering in the coal up to a rock face where a tunnel was begun. This tunnel was started off and driven without any of the steel sets being disturbed by the blasting.

Fig. 38 shows the method of timbering employed to start a curve off the main haulageway. The large carrying collars were 12-in. H-sections 24 ft. long, supported on 10-in. H-section legs.

Fig. 39 shows steel replacing wood and gives a good idea of the relative size of steel and wood for the same work. Fig. 35 shows a concrete pier head on a curve near a shaft bottom. Steel beams are resting on the pier head.

I wish to express my thanks to my many friends in the anthracite region whose assistance and courtesy have made these articles possible.

In conclusion, to men who are younger and have had less experience than myself, I would say that only by concentrating work, keeping development ahead and maintaining all working places in good condition, can coal be consistently mined economically. Mother Nature will yield up her treasures gracefully, if proper methods are used: but woe to the robber, for his work will surely exact punishment.

Recollections of a Manager

Fully six months passed after my appointment as manager before I learned why I had been given the appointment. The events that led up to my receiving the information were about as follows:

Arthur Benton, the superintendent at Hanging Rock, our largest colliery, dropped dead one morning while en route from his home to the office. As Mr. Benton had always been considered a very capable superintendent,

FIG. 39. COMBINATION OF STEEL AND WOOD TIMBERING

in fact had been considered the logical successor for Mr. Scott, our manager, by most of the company's employees, I had given him a pretty free hand with his operation, even going so far as to cancel at the last minute the regular quarterly inspection trip planned for his mine because I felt that I could spend the day to better advantage at one of the mines where things seemed to be going wrong.

Two days after Mr. Benton's death I went to Hanging Rock to decide upon his successor. In my own mind I had decided to give his mining engineer preference, holding in reserve for second choice the mine foreman, if that gentleman should make the best impression upon me. I had worked up to superintendent's rank through the engineering route, but in spite of that fact I realized that mine foremen often make excellent superintendents, and I was of the opinion that in selecting a man for a superintendency, a good mine foreman should always be preferred to a poor engineer.

I found after spending a full day at Hanging Rock that I was not in position to announce Mr. Benton's successor, as neither the engineer nor the best mine foremen in his organization seemed to measure up to the standard that I had in mind. I felt, however, that they were entitled to further consideration and decided to continue the investigation several days longer so as to get a better line on the two men.

I postponed the appointment first for a week and then for a second week, but finally had to eliminate both of the men from consideration and gave the appointment to a mine foreman employed at one of the company's other mines.

At the next meeting of our board of directors I explained my action and remarked in closing that I hoped that such an alternative course would not be found necessary in the future. Much to my surprise all of the directors present made haste to congratulate me upon my good judgment, and then one of them volunteered the information that I had been chosen manager because I seemed to be the only superintendent in the company's employ able to leave his office for a week without being missed.

It had always seemed to the directors that some of the superintendents were afraid to train men to take their places, fearing that the understudies might become too ambitious; while other superintendents were unfortunate in their choice of men and never seemed to have men in their employ possessing the necessary ability. At any rate they had decided that my promotion would not disrupt the organization that I had built up, which was more than they could say for most of the other superintendents.

I had never thought of the matter in quite that light before and naturally was very much pleased with the line of argument. Moreover, some of my friends were continually wanting to know how I came to be appointed manager, and now I had a reasonable answer to their question.

The next day I had further occasion to recall the directors' point of view, since Mr. Jenkins, the superintendent who had trained the foreman picked to succeed Mr. Benton, protested at having to give him up. When I repeated some of the remarks the directors had made to me, he immediately withdrew all objections and went on his way rejoicing.

An Original and Effective Mine Signal System

The A. Hanna Coal Co., operating mines in Michigan, has equipped its shafts with a signaling system as effective as it is novel. Confronted with a signaling problem in connection with the cage operations, the mine officials coöperated with the Western Electric Co. in the design of a special system of signals.

The system and its operation are simple, being essentially as follows: At each of the various mine levels loud-ringing extension bells are installed in pairs, each pair consisting of one 6-in. and one 8-in. weatherproof type loud-ringing gong. In connection with these bells special switches are installed at each level. They consist of a telephone switch hook housed in a weatherproof cast-iron casing. Attached to the switch hook and hanging from the casing is a long leather strap similar to the well known street-car strap. Pulling this strap makes contact and rings the 6-in. bells on every level and one in the engineer's room.

When a man has loaded a car and wants it hoisted, he pulls the leather strap a number of times—the number corresponding to a prearranged signal that indicates the operation desired. The bells ringing on each level in connection with the engineer's bell serves as a warning to the men on the various levels. The 6-in. bells are on one circuit and the 8-in. bells on another—the latter being rung by the engineer when he is ready to hoist, or as a summons.

The wires of the signaling circuit are used for a telephone system with an instrument in the engineer's cabin and one on every level. The system is simply a magneto party-line circuit and is used as a means of communication in connection with the signaling system, between the various levels and the levels and the engineer.

The company has placed great reliance in its new signal system and has taken great precaution to keep it in operation. A supplementary circuit has been wired so that if the ringing current in connection with the system should fail, warning bells will ring, summoning a repair man. The Hanna Coal Co. is at a loss to understand how it ever got along without this signal system that permits of better and quicker work with less hazards.

COMING MEETINGS

The American Mining Congress will hold its 19th annual session during the week beginning Nov. 13, 1916, at the Hotel La Salle, Chicago, Ill. Secretary, James F. Callbreath, Munsey Building, Washington, D. C.

The American Society of Mechanical Engineers will hold its next meeting Oct. 10, 1916, at 8:15 p.m., at the rooms of the society, 29 West 39th St., New York. Dr. Charles L. Reese, chemical director of the E. I. du Pont de Nemours Powder Co. will give an illustrated lecture on "Explosives." Secretary, Calvin W. Rice, New York.

A Miners' Field Day and First-Aid Contest will be held Oct. 21, 1916, at Jellico, Tenn., under the direction of the Tennessee Mine Foremen's Association, Southern Appalachian Coal Operators' Association, Tennessee Mine Inspectors and the Bureau of Mines. Twenty teams are expected to take part in the contest. Philip Francis, of Jellico, Tenn., is chairman of the General Committee.

The National Safety Council will hold its annual meeting and Congress at the Hotel Statler in Detroit, Mich., Oct. 17-20. The program is a long one, containing the names of 140 speakers. Wednesday and Thursday morning, Oct. 18 and 19, will be devoted to the mining section.

The Actual Worth of Oxygen Breathing Apparatus

By Thomas Jeremiah*

SYNOPSIS—The idea has been fostered that the oxygen helmet apparatus is a veritable, sure-enough life-saver. However valuable helmets may be in time of mine disaster in the salvage of property, records of actual life-saving by their use are conspicuous for their absence.

It occurred to me recently, after five years' experience with mine rescue equipment in Illinois, that it was time some word concerning the actual worth of oxygen breathing apparatus in mine disasters and mine fires should be spoken by some one other than those making their living by selling such equipment. "Whose bread I eat, his song I sing" naturally applies to the agents of the apparatus, who declare it to be a life-saver, and have no qualms of conscience in selling one set only, or perhaps two or three, to a mine operator, when experience has demonstrated beyond all doubt that the mine rescue apparatus now on the market is not safe for attempted rescue work on the part of *one* wearer alone, or even three—ordinary precaution making it absolutely necessary that no less than five men engage in the work, even such as putting up a brattice not far from fresh air.

The weight of the apparatus, ranging from 40 to 50 lb., its limited time of oxygen supply—1½ to 2 hr.—and the probability of a valve going wrong, make usage by one man or even three men far too dangerous to be attempted. No fewer than five men in a team should be permitted to engage in any helmet work; if one helmet man goes down, it will take four men to carry him any distance in his cumbersome apparatus, and one man should be free to act as a runner for help.

I cite this to show that apparatus, if purchased at all, should be purchased in sets of five, preferably sets of seven.

There has never been enough emphasis laid upon the danger of apparatus when worn by men not in the best physical condition, or not in steady training as helmet wearers. Mine explosions and fires, taking the lives of hundreds of men, showed the very evident need of some life-saving device, and the public can be excused for the credulity shown in accepting as true the reports concerning the worth of mine rescue apparatus. The general opinion now prevails that oxygen breathing apparatus is of such simple construction that the ordinary miner, after a few lessons, could don a set, manipulate it with ease and safety and be fully competent to enter a mine for exploration or life-saving purposes.

One coal operator, entertaining this idea, telephoned the Springfield Mine Rescue Station, asking the loan of three sets of apparatus for the purpose of opening up a seal. He said that one of his company men had taken six lessons in helmet wearing about 8 months previously and could instruct two other men in its use. Of course the apparatus was not loaned; the superintendent of the station could not knowingly be accessory to murder.

Recently, the Illinois Traction System, through the Secretary of State's office, asked the Springfield station for the loan of one set of apparatus for use by one of its men. It also had the mistaken idea that the helmets are like fire extinguishers—that a man of average intelligence, after reading the directions, will know instantly how to use them and put them in action.

A month or so ago, I was told that two men in Butte, Mont., with just a few lessons in helmet wearing, after an interval of several months without practice, put on the apparatus, entered the mine, and died in their equipment. I take it for granted that the company officials as well as the two miners were ignorant of the danger of untrained men engaging in helmet work, and of the absolute necessity of the wearers being mechanically familiar with the manipulation of the apparatus.

After touring Illinois for three years with mine rescue cars, instructing miners in the use of apparatus, the Illinois Mine Rescue Commission realized that its work was not efficient because the miners had no access to apparatus except when one of the three cars visited that vicinity; consequently, even the certificated men, after an interval of three months without training, would not be efficient helmet wearers and should not be allowed to jeopardize their lives by wearing apparatus under dangerous conditions.

Rescue Cars Are Removed

The cars were therefore called in off the road, and teams of five men were put to practicing at least two hours each week at each of the three mine rescue stations. The indiscriminate training of miners who had no access to apparatus was given up entirely, as being of no real benefit. In fact it was realized that the brief and insufficient training might make the miner more likely to endanger his life, as with no training at all he would not offer, nor would local opinion expect him to volunteer, to put on the apparatus for serious work.

Because the average miner and operator and the general public have little if any appreciation of the cumbersome weight, shortness of time which it is safe to wear the breathing apparatus (the oxygen supply lasting from 1½ to 2 hr.), and the possibility of the feeding valve going wrong, far more is expected of the helmet man than is possible even under the most favorable circumstances, and favorable circumstances do not customarily prevail in mine disasters. Misled by the glowing accounts of the apparatus agents as to the number of lives saved by their helmets, and the lack of courage to speak the full and exact truth on the part of those competent to judge the apparatus intelligently as to its actual worth, this mistaken impression has not only been allowed to prevail but has even been encouraged by those making their living out of the apparatus business.

Widely advertised as life-savers, the wearers of the helmets are naturally expected by the public to enter the mine in case of disaster, proceed to find entombed

*Chairman, Mine Investigation Commission, Springfield, Ill.

men, no matter how far these may be inside the workings, and conduct them to safety. Just how men can be brought out alive through irrespirable air that necessitates their would-be rescuers wearing oxygen apparatus is a matter that I have never been able to solve; and careful research has failed to produce any reliable facts to substantiate the claim of the helmets having saved life, although there are authentic records of lives being lost by them. When traced to their source, the records of lives saved is as false as the report that went out during the Cherry disaster that oxygen helmets saved the entombed men.

Since the two-hour apparatus is heavy of its own weight, its wearer would not be able to carry an extra set to put on the man to be rescued. One type of apparatus has an extra tube attachment for furnishing oxygen from the rescuer's own apparatus. This sounds well theoretically, but practically contains more danger than safety to either rescuer or man to be saved, because, except under most favorable conditions, the apparatus-wearer's supply of oxygen is not amply sufficient for himself let alone another man.

The truth about the helmets as I know it is that they have a field of value as property savers; but as life-savers, I frankly acknowledge that my most earnest search has failed to substantiate—to my own satisfaction—any record that helmets have saved life. The present helmets are too heavy and too time-limited as to oxygen supply to warrant the wearer making an extended search for entrapped men, and even if the helmet wearers reached such entrapped men, I fail absolutely to see how the entrapped men, without oxygen helmets, can be brought out through irrespirable air. Until the apparatus is made light in weight, and cheap enough in price to warrant the miners and operators having it inside a mine—not outside at a station probably miles away—no record as life-savers can reasonably be expected.

The sanest article that I have yet seen on this matter of oxygen helmets appeared in the *Colliery Guardian* some time ago, written by a man who had been testing out several types in England. I quote from the article as follows:

> There are about four different makes in England, and they are called "portable" because they weigh 40 lb. One maker's list contains only about 100 items of spare parts for the apparatus, while a further list of 40 items is necessary for a rescue station. One item particularly interested me. The agents sell the air tester for $55 to $85. Personally, I do similar testing with a $2.50 instrument, which is quite satisfactory. Mine owners offer big prizes of $5,000 for a safe and cheap electric lamp, and I would suggest that if mine owners want to do away with the present cumbersome, complicated and dangerous apparatus, a similar prize should be offered for the best oxygen apparatus, the conditions to be as follows: (1) Light weight; (2) length of time available; (3) simplicity; (4) smallest number of joints, valves, etc.; (5) durability and strength; (6) low cost.
>
> I am informed that in America men who had been entombed by an explosion for several days have been saved by their means (Note—The writer probably believed the Cherry report true!), but I am not convinced that they would not have got out without them.
>
> We know that at Courriers, France, with its 1,000 dead, many different types of apparatus were used, and not a life saved, but one man killed in wearing one. I think the present apparatus and system good enough for fighting mine fires, but for them to be of any use in an explosion they must be simplified and made cheap enough to be stored at the miners' end of an explosion, not stored away in offices or rescue stations miles away. If the manager of a mine could let the rescue station know two hours in advance of an explosion, the present arrangement would work pretty well.

I particularly emphasize these points and call attention to them because I think it due time that the mining industry was knowing the exact truth about devices intended for safety.

The first airships were extremely unsatisfactory, cumbersome and dangerous; but constant effort has produced an aëroplane that seems to be used safely enough and easily enough, at least by the Germans. I have no doubt but that the future will produce a satisfactory and light-weight mine rescue apparatus which can be used for hours in the mine without much danger to the wearer. Earnest efforts should be directed to this end. This will be done when the mining industry is awake to the fact that the field of the present oxygen breathing apparatus is far too limited to warrant the reliance at present placed in it.

Washington State Meet

SYNOPSIS—Third annual first-aid and mine-rescue meet proves a big success. Labor and company officials both give their enthusiastic support to a movement which has become very popular with the miners. Competition of junior teams a feature of the meet.

The third state-wide mine-rescue and first-aid meet in the State of Washington was held in the Stadium, Tacoma, Wash., on Aug. 19, 1916, under the auspices of the United States Bureau of Mines and the Washington Mine Safety Association. The contest was in charge of a general committee composed of J. J. Corey, United States Bureau of Mines; James Bagley, state mine inspector; D. C. Botting, commissioner of the Washington Coal Operators' Association, and Martin J. Flyzik, president, District No. 10, United Mine Workers of America.

Thirteen first-aid teams, 6 mine-rescue teams and 5 juvenile first-aid teams all from coal-mining towns, and 2 first-aid teams representing the Seattle Municipal Lighting Department, participated in the meet. The contest began at 1:30 p.m. and concluded at 9 p.m. with a demonstration of the explosibility of coal dust when a wooden gallery 84 ft. long was charged with coal dust and exploded by means of a shot fired from a cannon.

Each year the state meet is the cause of spirited rivalry, but this is always characterized by a spirit of fairness and a desire to see the best team win. A holiday was proclaimed at all the mines, while special trains were run from all the mining camps and about 2,000 people attended the meet. It was necessary for many to travel over 100 miles to be present, and J. P. White, international president, United Mine Workers of America, was very much pleased with the miners' representation and the spirit of the meet. As the work progressed it was evident that each team was determined to win, but there was no dissension from the judges' decisions.

Among the prominent mining men present were: C. C. Andersen, manager, Northwestern Improvement Co.;

MINE-RESCUE TEAM PREPARING TO TEST APPARATUS

C. E. Jones, general superintendent, Roslyn Fuel Co.; William Hann, manager of mines, Pacific Coast Coal Co.; L. D. Jones, mine superintendent, Puget Sound Traction, Light and Power Co.; J. F. Menzies, manager, Carbon Hill Coal Co.; J. T. Lee, general superintendent, Wilkeson Coal and Coke Co.; Archie Patrick, vice-president, Roslyn Cascade Coal Co.; Milnor Roberts, Dean of the College of Mines, University of Washington, and many coal mine superintendents, foremen and union officials.

A FIRST-AID TEAM CARRYING A PATIENT ON STRETCHER

Six problems were given each team in first-aid, and the team with the highest average percentage was declared the winner. The winner of the mine-rescue contest was decided by the team receiving the highest score in the one event. There were no ties in the first-aid totals or mine-rescue contest, but ties occurred in the different first-aid events.

The following was the order of events in the first-aid contest.

Event 1. Man has been squeezed between car and timber, receiving a compound fracture of left thigh 5 in. above knee, with arterial bleeding; has bad cut on left side of face and left shoulder dislocated. Treat and carry on improvised stretcher 15 yd. Time, 17 min. Full-team event.

Event 2. Miner cuts through into old works and is struck on right temple by piece of coal; severe laceration, conscious; air is poor. Dress and perform one-man carry. Time, 3 min. for dressing. One-man event.

WINNERS IN MINE-RESCUE CONTEST, ROSLYN FUEL CO.'S TEAM

Event 3. Simple fracture right forearm and scalp wound on back of head; no bleeding. Treat and carry patient 30 ft. without using a litter. Time, 7 min. Two-man event.

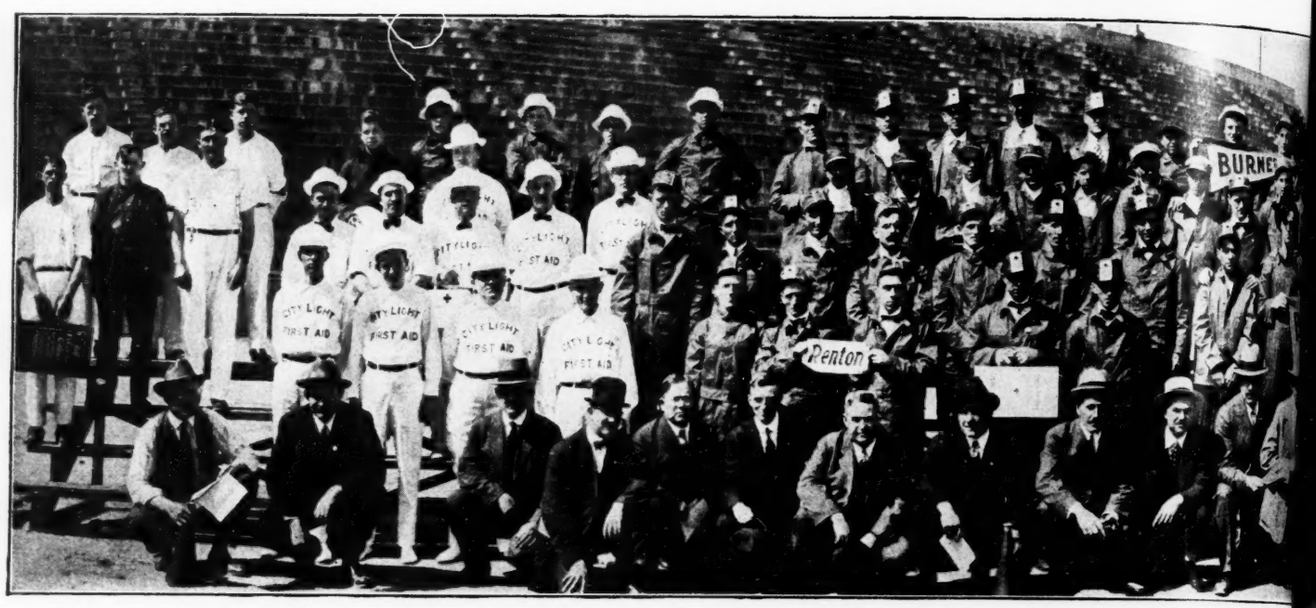
Event 4. Miner working on face of entry puts off shot while tamping and is caught under a fall of roof. Treat for the following injuries: (a) Burned about face, chin and neck; (b) fifth, sixth and seventh ribs are fractured on right side; (c) left collar bone fractured; (d) compound fracture of left thigh 7 in. above knee, with severe bleeding; simple fracture of right ankle. Time, 20 min. Full-team event.

Event 5. Miner caught by fall of rock on account of failure to timber or take it down; spine injured, left foot badly mashed, right leg fractured below knee, nose broken and lower jaw fractured. Treat and carry 50 ft. under cave 3 ft. clearance and stand upright to show work. Time, 20 min. Full-team event.

Event 6. Burns of head, face, neck, arms and hands; profound shock. Treat. Time, 12 min. Three-man event.

TABLE 1. TEAMS ENTERED AND POINTS AWARDED AT THE FIRST-AID AND MINE-RESCUE MEET OF THE STATE OF WASHINGTON

Name of Mine and Company	Events						Points	Average
	First	Second	Third	Fourth	Fifth	Sixth		
Pono—Washington Union Coal Co.	86	98	72	100	97	97	550	91.66
Carbonado—Carbon Hill Coal Co.	93	95	...	96	93	98	475	79.16
Beckman—Roslyn Fuel Co.	93	100	100	99	100	96	588	98.00
No. Elum No. 7—Northwestern Improvement Co.	100	94	100	100	95	98	587	97.83
Wilkeson—Wilkeson Coal and Coke	98	100	90	94	88	97	567	94.50
Roslyn No. 6—Northwestern Improvement Co.	100	100	96	100	94	95	585	97.50
Pono—Washington Union Coal Co.	100	100	94	81	100	97	572	95.33
Renton—P.S.T.L. & P. Co.	91	100	100	71	95	100	557	92.83
Ronald No. 3—Northwestern Improvement Co.	100	100	98	83	100	97	578	96.33
Renton—P.S.T.L. & P. Co.	90	100	100	87	73	100	550	91.66
No. Elum No. 7—Northwestern Improvement Co.	98	100	100	100	100	100	598	99.66
Burnett—Pacific Coast Coal Co.	100	94	98	100	100	100	592	98.66
New Castle—Pacific Coast Coal Co.	100	100	100	100	96	99	595	99.16
City Light, Construction, Seattle	93	94	100	96	...	...	383	95.75
City Light, Operating, Seattle	95	96	100	100	...	...	391	97.77
Black Diamond School Boys	99	100	94	100	100	95	588	98.00
Burnett School Boys	100	100	98	93	95	95	581	96.85
Wilkeson School Boys	93	96	100	100	100	100	589	98.16
Beckman School Boys	88	96	100	100	95	86	565	94.16
Carbonado School Boys	94	98	95	94	98	95	574	95.66



FIRST-AID TEAMS, JUDGES AND

The points awarded by the judges in the different events are given in Table 1.

The official judges were as follows: Doctors F. H. Pratt, Willard, MacLean, Yokum, Swearingen, Hunter, Penney, Montague, Wall, McNerthney, James, Jonez and Mowell.

In the first-aid contest Cle Elum mine No. 7 team won the first prize, consisting of the Dupont Cup and $15 in cash. This cup must be won at two consecutive state-wide meets to be retained by the team. A team from this mine has been the winner at three such meets and have retained one cup. The team from New Castle mine won second prize of $10. The Burnett mine team won third prize of $7.50.

In the boys' contest the first prize of $7.50 went to the Wilkeson team; the second prize of $5 to the Black Diamond team; the third prize of $3.50 to the Burnett team, and the fourth prize of $2.50 to the Carbonado team.

A prize of $5 was won by the construction department of the Seattle Municipal Lighting Department.

The personnel of the winning teams was as follows: Northwestern Improvement Co., No. 7 Mine, Cle Elum—Joe Parker, captain; Wilson Clark, William Clark, Harry Milburn, Harry Ronald and Joe Andreotty; score, 99.66 Pacific Coast Coal Co., New Castle Mine—Claude Tutt, captain; George Elner, William Jones, Thomas Greggs, Walter Greggs and John Daniellson; score 99.16. Pacific Coast Coal Co., Burnett Mines—Arthur Jones, captain; Dick Brady, Dick Williams and George Evans; score 98.66.

Mine-Rescue Event

Fire reported in face of gangway inside of last crosscut, fan stopped, rescue crew will enter mine, build temporary stopping to seal off fire. When, stopping is completed one of the crew is found in distress. Remaining members of crew will rescue man to fresh air and treat. Time, 20 min.

The judges in the mine-rescue contest were: Dudley Michell, instructor, Mine Rescue and First-Aid, Department of Mines, British Columbia, and J. D. Stewart, instructor, Mine-Rescue Station, Nanaimo, B. C. The judges awarded points as follows in this contest:

Name of Mine and Company	Score
Burnett—Pacific Coast Coal Co.	89.80
Roslyn No. 6 Mine—Northwestern Improvement Co.	87.40
Beekman—Roslyn Fuel Co.	99.00
Tono—Washington Union Coal Co.	88.80
Cle Elum No. 7 Mine—Northwestern Improvement Co.	96.40
Black Diamond—Pacific Coast Coal Co.	91.00

In this contest the Beekman team won the first prize consisting of the Dupont Cup and $15 cash. This cup must be won at two consecutive state-wide meets to be retained by a team. This is the second time that the Beekman team has won this cup, but it was won last year by a team from Roslyn No. 6 mine, and consequently must be won next year by the present winners to be retained by them. The second prize of $10 went to the Cle Elum mine No. 7 team, and the third prize of $7.50 to the team from the Black Diamond mine.

The personnel of the winning teams in the mine-rescue contest were:

Roslyn Fuel Co., Beekman Mine—William Shaw, captain; Thomas Wallace, Harry Taylor, Robert Bell and Fred Bianco; score 99.00. Northwestern Improvement Co., No. 7 mine, Cle Elum—Charles Nunn, captain; Matt Hind, Edger Little, Joe Hodgson and J. Fisher; score, 96.40. Pacific Coast Coal Co., Black Diamond Mine—M. A. Morgan, captain; Joseph McDonald, William Nute, James Carson and Charles Sampils.

The official recorders of the meet were: David J. Price, United States Department of Agriculture, and James E. Ash, mining engineer, Roslyn Cascade Coal Co. E. S. Brooks, president, Coal Operators' Association, and John P. White, international president, United Mine Workers of America, served as the committee on awards.

The $120 in cash prizes was donated by the miners and operators of Washington, and the Denny Renton Clay and Coal Co. The silver cups were donated by the Dupont Powder Co.

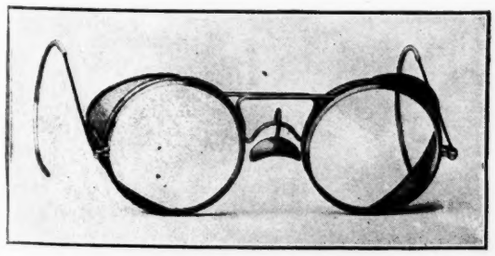
The Number of Pounds To Be Taken as a Gross Sample to represent a given lot of coal varies with the character and condition of the coal, and not with the amount of coal to be sampled. The character and proportion of the bony coal, slate, etc., and the size of the particles of both coal and impurities are the governing factors.

OFFICIALS, WASHINGTON FIRST-AID MEET

Care of Eyes at Mine Plants

When an automobilist who has traveled mile after mile in goggles says that the workman—who needs goggles far more than he does—will not wear them, it seems fair to assert that he has never really tried to foster their use. There is no reason why a pair of goggles of proper focus should inconvenience any working man, and the need for them is surely acute in many parts of the surface plant and even in the mine.

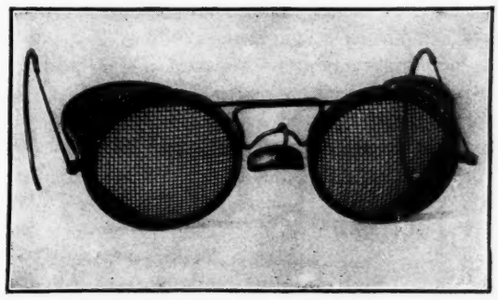
It is said that in Cuyahoga County, Ohio, some one workman loses an eye every 11 days, and he is doing work of much the same nature as is done in repair and blacksmith shops around the mines. With our wasteful system of changing workmen every few days, it is unfortunately necessary to make the goggles adjustable or otherwise they will not suit the many widths and heights of the noses of those who must use them. It is needful also to contrive a nose bridge which is adjustable, so that the glasses may be placed at any angle and distance from the face. This is carefully provided for in the Adjustoglas. The lenses in these goggles are of clear white extra-annealed and toughened material free from imperfections and furnished with a broad beveled edge



GOGGLES FOR GENERAL INDUSTRIAL PURPOSES

which sheds flying particles. The lenses are free from waves, striæ, bubbles and the many other imperfections which eye protectors have formerly had. The side screens are strengthened with a stiff piece of metal, and the rims of the goggles are deeply grooved so that the lenses cannot be driven through their frames.

The glasses are not made of steel, but of a strong white metal which will not corrode and which can, without deterioration, be sterilized in boiling water, in steam or by other agents. Yet the material is strong and takes a fine finish. The lenses are in three thicknesses appropriate to the kind of work to be performed, the heaviest lens



FOR MINERS' USE—WIRE SCREEN AND NO GLASS

being $\frac{3}{16}$ of an inch in thickness and suited to the most hazardous work in the mill or in the mine.

The eye protectors must fit well, must not try the eyes or they will not be worn. But a lens may be a danger to the wearer and not a protection if when broken the edges are thrust into the eye. This is why the stiffness of the goggles and the depth which the glass sets in the rings are of value. When the lens breaks, if break it does, it will remain in place and protect the threatened member.

Where goggles have to be worn in hot places they are provided with rims and bridges covered with leather and the temples—ear loops—are covered with waterproof fiber. The lenses are often made of colored glass. Goggles for miners are frequently made with wire-screen fronts instead of glass. These Adjustoglas spectacles are made by the Strong-Kennard & Nutt Co., 507-521 Schofield Bldg., Cleveland, Ohio. They also make respirators which weigh only a half-ounce, admit of free conversation, do not interfere with the use of goggles and are readily sterilized in boiling water. These respirators protect their wearers from irritant siliceous particles which are set in motion by the working of rock drills in sandy strata.

The Electric Safety Lamp

By Richard Koch*

SYNOPSIS—Some interesting figures on the cost of upkeep of miners' electric safety lamps are here given. In England the safety hand lamp appears to be a favorite.

There have appeared frequently in *Coal Age* interesting articles dealing with the cost of upkeep of miners' electric cap lamps. This may be a fitting opportunity for a brief survey of facts and theory on this subject.

It would appear only right to draw attention to results that have been obtained by use of electric safety lamps during a considerable number of years, their employment dating to long before such lamps were adopted for use in this country, and to results obtained in domestic installations of this kind.

In two issues of *Coal Age* (Oct. 2, 1915, and Mar. 11, 1916), statements have been previously made, purporting to give the cost of upkeep for electric safety cap lamps. One of these dealt with an installation of 250 lamps, which had been in use for not more than 6 mo., while another speaks of an installation of only 27 lamps in use for a period of 12 mo. It is believed that neither of these reports can be taken seriously, especially as an unduly large percentage of material, that had been used during the respective periods, had been figured as charged to the miners. This, as a general rule, is not customary. Furthermore, as has been stated above, the first installation mentioned showed the results for 6 mo. only, whereas the second installation represents a relatively small quantity of only 27 lamps, which is too small to be given as a standard basis for an installation of this character.

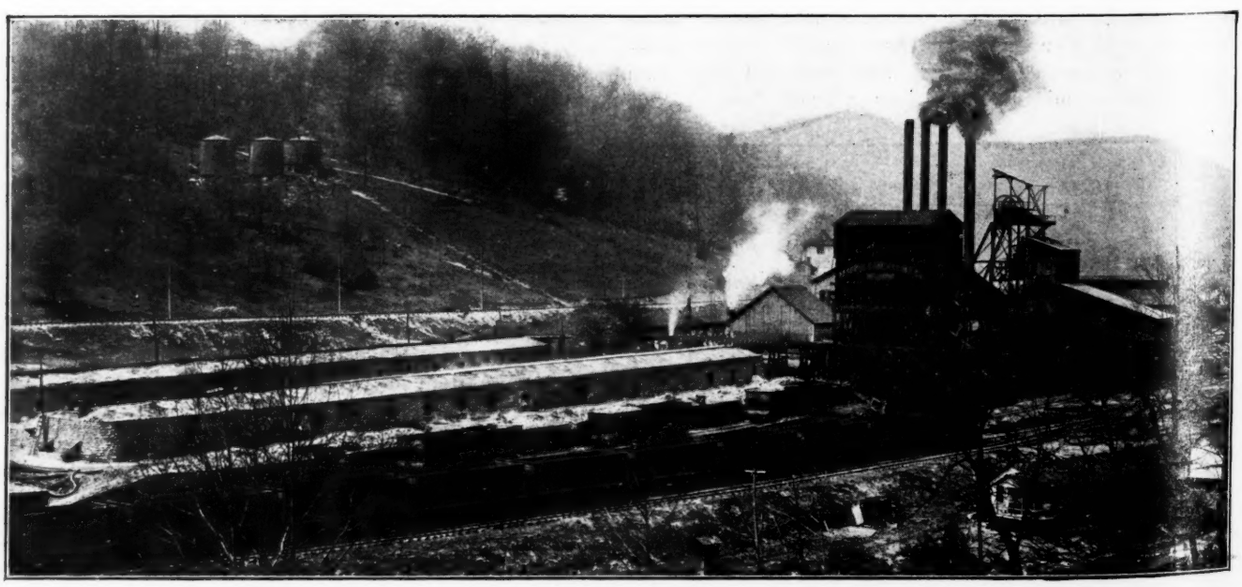
In the issue of July 1, 1916, figures were given for the cost of upkeep for electric cap lamps with alkaline batteries for periods ranging from 3½ to 8 mo. and the results establish that the cost of maintenance per lamp shift was 0.4c. and 1⅛c. respectively. The expenses for material for the first 3½, 6 or even 8 mo., in my opinion, can hardly be regarded as a proper basis for judging the actual average expenses of lamp installations. In figuring the ultimate expenses for adequate periods of operation, the expenses for repairs and replacement of batteries must be finally taken into consideration, even if the batteries will actually operate for quite an unusual period.

Electric cap lamps have not been in use in large enough quantities and for a sufficiently long time to allow a clear opinion to be formed as to their ultimate cost of repair. Furthermore, improvements are continually encouraged by the U. S. Bureau of Mines as for example in regard to the cap-lamp, cable cord, bulbs, etc.

Interesting data for periods covering years of operation, and dealing with the use and maintenance cost of electric safety hand lamps with lead batteries have appeared in English journals. The *Iron and Coal Traders' Review* for Oct. 1, 1915, gives figures which may be obsolete, since a great number of lamps have been added since that time. That electric safety lamps of this kind can be kept in good working order for ⅝ of a penny per lamp shift, which would be about 1¼c. in American money was the object of discussion. In this country electric safety hand lamps of the same style (the first lamp of this variety approved by the U. S. Bureau of Mines, in the year 1913), have been in operation for years and have established records of high efficiency in operation and low maintenance expenses.

At the mine of the Federal Coal and Coke Co., Grant Town, W. Va., an installation was started in October, 1914, with 80 electric hand lamps and this number was increased to 560 lamps in April, 1915. A record is therefore available for this considerable number of lamps, for an entire year.

*Pittsburgh, Penn.



THE FEDERAL COAL AND COKE CO.'S PLANT AT GRANT TOWN, W. VA.

The total cost of material shipped to this particular mine during the 12 mo. in question amounted to $1,769.51. During this period, the sum charged to the miners on the pay roll, for material intentionally or carelessly destroyed, amounted to $196.88 so that the total cost of material to the company, ranging over a period of a full year, was $1,572.63. In this amount no consideration was taken of the materials and repair parts still on hand in the stock-room of the mine, at the expiration of this period. The value of these materials and parts was quite appreciable.

During this period the number of lamp shifts furnished to the mine amounted to 141,316, so that the cost per lamp shift for maintenance and upkeep would amount to 1.11c. These figures can be verified by anyone so desiring from the books of either the operating mine or the lamp manufacturers.

The above figures do not include labor. The lamps at the above-named mine were in charge of an expert lamp man with from 2 to 3 assistants, according to the conditions prevailing at the mine, but the total wages paid out at the lamp house at no time amounted to more than about $200 per month. This would amount to approximately 1.4c. per lamp-shift.

The total cost of operation for material and labor therefore amounted to approximately 2½c. per lamp-shift, which, according to the best estimates obtainable—although no exact records seem to have been kept—is below the actual cost of many electric safety lamps or even oil or benzine safety lamps.

These lamps have been used daily without interruption since they were first installed. It should also be noted that only a small percentage of the material actually used was charged to the miners; viz., about 11 per cent.

An extract from the British paper mentioned above (*The Iron and Coal Traders' Review*, Oct. 1, 1915, p. 428), may be of interest to those engaged in mine operation. This shows that for years, at least in British coal mines, electric safety hand lamps were used with considerable success, before the electric cap lamp was developed to its present standing. The following figures were abstracted from the British inspectors divisional reports. They are both authentic and reliable.

ELECTRIC SAFETY HAND LAMPS IN USE DURING THE YEARS 1913 AND 1914 IN ENGLAND

Type of Lamp	Total, 1914	Total, 1913
Ceag	44,866	24,237
Oldham	14,643	2,420
Gray-Sussman	8,556	10,283
Wolf	6,895	503
Joel-Fors	491	
Float	136	
Bristol	68	380
Yarta	42	
Thomson-Rothwell	10	
	75,707	37,823

It is interesting to note, that in England during the year 1914 60 per cent. of all electric safety lamps, more than all other electric safety lamps together, were the so-called "Ceag" lamps. This is the lamp for which the maintenance figures are given above. Comparative figures for 1915 are not yet available, but estimates show that the number of lamps of this type has been increased from 44,866 in 1914 to about 85,000 in 1915.

These facts are significant and tend to illustrate the confidence placed in electric safety hand lamps. The sole agent for these lamps in the United States is the Concordia Safety Lamp Co., of Pittsburgh, Penn. This firm has installed many of these Ceag lamps in this country, among which are those at the plant of the Federal Coal and Coke Co., the maintenance figures of which were given.

A few months ago this firm succeeded in receiving the formal approval of the U. S. Bureau of Mines, under Schedule 6A for its electric safety cap lamp, which roughly speaking, contains all the merits of this well-tried safety hand lamp, as far as the most important features are concerned. These include the design of the safety device, arrangement of the contacts, style of battery and battery material. A detailed description of this lamp will appear in a later issue of *Coal Age*.

Accidents from Carelessness

By W. L. Morgan*

Of all the accidents that happen in mines, the most needless and unnecessary are those that result from miners returning too soon to a fuse shot. It is generally the case that if two fuse shots are fired and only one goes off, the miner becomes possessed of a fever of impatience to know the reason why the other shot did not explode.

I remember an actual instance where a room was just three cuts in from the entry and two rib shots were fired with a fuse. After the fuses were ignited, the miners retreated to a safe place. However, one of the shots delayed in going off, and a miner went to investigate the cause. He succeeded in getting close to the hole when the second shot fired, killing him instantly.

I remember another instance of almost an identical nature. One of the men had been working in the mines 26 years; the other man had 12 years' experience. The older miner accused the other of not igniting his fuse; the younger man said he had done so. After waiting a while, the more experienced miner said he would go and see for himself. When he reached the shot it went off, rolling the coal over in one big chunk; although the coal was thrown clear of the man's body, the fine dust from the tamping and from the shot was blown into his eyes, entirely destroying his sight. The pity of the whole thing was that, the call for the ambulance was sent in 7 min. before the proper shooting time of that mine.

In the same mine one of the most experienced men went back to a solid shot that hung fire, reaching the place just about the time the shot went off. He narrowly escaped being killed, but lost the sight of one eye by dust being blown into it.

I know of a number of such accidents, and it is astonishing how many old miners will risk their lives by returning too soon to fuse shots. One reason may be that time moves slowest when the miner is waiting for a shot to fire. However, the law states explicity that no person shall go back to a fuse shot that has missed fire until the following day.

Many other accidents result from improper and careless handling of powder. It was the practice of one miner I knew to empty the powder from his keg into his cap, and from his cap he would fill his cartridge. One day his keg was nearly full of powder. He carelessly put his light on a rock on the gob and went ahead filling his cap with powder as usual. Whether it was owing to the jar of setting the keg roughly on the ground, or the insecure foundation of the lamp, no one ever knew, but the lamp rolled off the rock and tumbled

*East St. Louis, Ill.

into the cap of powder, setting it off, at the same time causing the powder in the keg to explode. The poor miner hardly had a rag left on him after the explosion and died 24 hr. later.

When we think of the many miners who fill their cartridges with powder while their lights are on their heads, and of all the other men who smoke while seated on a tool box that contains powder, it is remarkable that there are not more serious accidents.

I recollect a remarkable escape where a miner had filled his cap with powder and then dropped his lamp off his head right into the midst of the powder. The lamp fell in an upright position, and being a carbide light no spark dropped into the powder. If this miracle had not happened, there would be one miner less today.

Many accidents result from forcibly ramming powder into shot-holes. One accident occurred not very long ago from a miner tamping the hole with the tamping bar in front of him; the powder ignited and drove the bar into the body of the unfortunate miner. In another case the miner had the keg of powder close to the hole. This man's practice was to fill the cartridge at the hole instead of at the powder box. This necessitated his bringing the keg of powder to the face to load his cartridges as he needed them. On the fateful day his cartridge stuck in the hole and the miner tried to loosen it by using the sharp end of the tamping bar, with the result that the powder in the hole ignited, and the flame that shot out lighted the powder in the keg, killing the miner instantly. In still another case a sulphur ball was met with at the end of the first bit, and on the day following, the miner could not get the head of the tamping bar beyond the sulphur without some twisting. The cartridge stuck at that particular spot, and the miner jammed at it until it went off, destroying the sight of both his eyes.

The sad part of it all is that practically all such accidents are preventable and could have been averted by exercising ordinary precaution and using just a little commonsense.

Sprinkling Car for Mine Use

By F. F. Jorgensen*

SYNOPSIS—Description of a tank sprinkling car that has successfully stood the test of practical usage. The car is designed so that the spray may be directed in any direction.

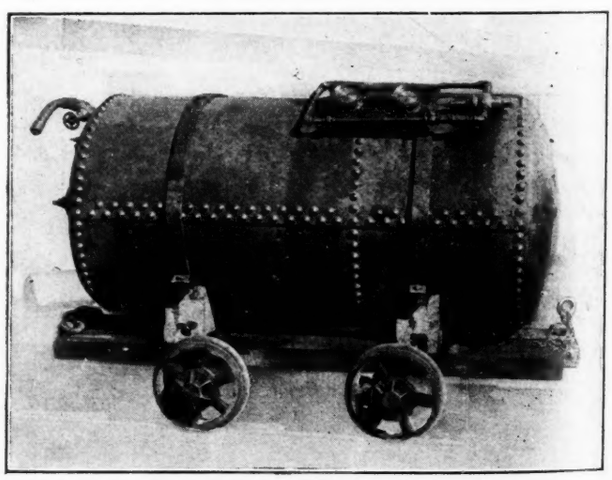
The ordinary type of sprinkling car used in mines is a wooden tank mounted on trucks, the tank having a large hole in one end at the bottom. Before filling the tank, a wooden plug is driven into this hole; and when the car reaches the piece of road to be sprinkled, the plug is removed. None of the dust except that between the rails is reached by the water, and that part is thoroughly soaked. This dust is usually not very harmful, for it is pretty well mixed with shale dust. The dangerous dust, of course, is on the ribs and timbers; and to reach this the sprinkler described in the following paragraphs was devised.

The device consists of a two-compartment steel tank mounted on trucks to run on track of any gage. The tank, as shown in the accompanying drawing, is equipped with two valves *H* and *G*, and two short lengths of hose, each having a quick-connection coupling numbered 1 and 2. The tank is also equipped with a valve *I* at the rear to which is attached the pipe connections 3. These connections are drilled in such a manner as to make a spray when water is forced through them.

Where the valves *H* and *I* are connected to the tank, a pipe connection on the inside runs close to the bottom of the tank. Two pressure gages *C* and *D* are connected to the tank, one in each compartment. The tank is also equipped with a pressure-reducing valve *E* and a check valve *F*, which are connected to the tank by means of pipe and pipe connections 4 and 5. These connections are located on opposite sides of the partition that divides the tank into the two air- and water-tight compartments *A* and *B*. Compartment *B* is equipped with a manhead to make it accessible for cleaning out and repair purposes.

*Chief engineer, Chicago & Northwestern Coal Properties.

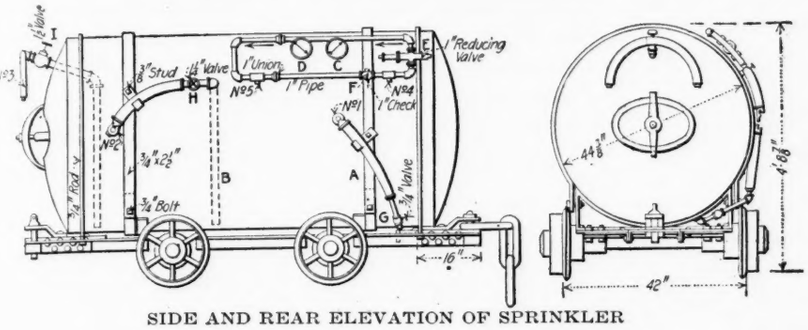
The operation of the sprinkling tank car is as follows: Hose 1 is connected to a compressed-air supply line, and the valve on the supply line and the valve *G* are opened, admitting compressed air into compartment *A*. When the pressure in compartment *A* rises above the limit set by the reducing valve *E*, compressed air begins to flow through pipe connection 4, reducing valve *E* and pipe connection 5 into compartment *B*. When the pressure in compartment *B* reaches the limit set by the pressure-reducing valve *E*, the valve in the supply line and the valve *C* are closed, and the quick connection 1 is uncoupled. The limit set by the pressure-reducing valve may be anything desired, from zero up to the maximum pressure available in the supply line.



SIDE VIEW OF SPRINKLER

Connection is then made at 2 with the water-supply line. The valve in the water-supply line and the valve *H* are opened and water is admitted to compartment *B*. This water must be under great enough pressure to flow against the pressure in the tank. As the water flows into

compartment *B* the air in this compartment is compressed and the pressure rises. When this pressure exceeds the pressure in compartment *A*, the air starts to flow from compartment *B* through connection 4, check valve *F* and pipe connection 5 into compartment *A*. When compartment *B* has filled with water, the valve in the supply line and valve *H* are closed, and connection 2 is uncoupled. The order of filling with air and water may be reversed; that is, compartment *B* may be filled with water first and



SIDE AND REAR ELEVATION OF SPRINKLER

then compartment *A* filled with compressed air; but in this case the pressure of the compressed-air supply must be higher than in the first order of filling.

The tank is now ready to begin sprinkling. Both compartments *A* and *B* have the same pressure, but as soon as valve *I* is opened the pressure in compartment *B* drops to the pressure at which the pressure-reducing valve *E* is set. The air continues to pass from compartment *A* through the pressure-reducing valve *E* into compartment *B*, maintaining a constant pressure over the water in compartment *B* until the water in that compartment is forced out through sprinkler connection 3. The sprinkler 3 is so made and connected that the spray of water may be directed against the roof and sides of an entry, or in any other direction.

Any water getting over into the air compartment *A* when filling compartment *B* with water may be blown out through connection 1 by opening valve *G*.

The sprinkler may also be used for fire-fighting purposes, or any other purpose where water may be needed, by connecting the desired length of hose to connection 2 and opening the valve *H*. The accompanying photograph shows the tank, complete with all gages, valves and connections, mounted on a roller-bearing truck and ready for use. The car shown here has been in service for about nine months and has proved very satisfactory.

A Safety Switch

Each year the newspapers print accounts of accidents resulting from the use of the open switch in industrial plants. Often such accidents go unrecorded, but were it possible to make an accurate accounting the total would probably be surprisingly large. An open-switch accident may mean death from shock to a workman with resultant demoralization of others. Or a switch may be thrown while a repair man is working on shut-down machines. Fires resulting in loss of life and property are often caused by short-circuit from the open switch.

The "Square D" inclosed switch, which is being placed on the market by the Western Electric Co., is announced as a remedy for the open-switch evil. Its development has been carried out in accordance with the principles of the safety movement in the standardization of equipment.

The "Square D" inclosed switch is also recommended for the use of central stations as entrance service equipment where metered service is given. It effectually prevents the theft of current which is generally accomplished by wiring around the meter. The switch terminal and fuse are under lock and key, and while the electric-current user can turn the current on or off at will by means of the handle outside the box, the current-carrying parts and wiring remain inaccessible. Meter trims for joining the switch box and meter are available for any type of current meter. The switch and cut-out unit are completely inclosed in a metal box provided with a hinge cover which is held closed with a simple spring catch. The switch is operated by a crank handle located outside the box. It may also be locked in the "off" position to prevent accident when repairs are in progress. Means are provided to lock or seal the cover shut to prevent unauthorized persons overfusing the switch or tampering with live connections. These switches are also provided with a label issued by the Underwriters' Laboratories, indicating that they have been examined and tested with the object of classing them as safety apparatus.

They have also been definitely approved by the Federal Bureau of Standards and the Workmen's Compensation Service Bureau.

The "Square D" inclosed switch is made in two general types: The pressed steel type suitable for lighting circuits, machine tools and other uses where severe service conditions do not prevail, and the plunger, or cast type, which is of more rigid construction and designed for especially severe service.

The pressed-steel switch is made for all commercial voltages from 125 to 600 volts, and in capacities of from 30 to 600 amp. All switches for 60 amp. and over are equipped with a quick-break attachment to prevent the formation of dangerous arcs. The ends of the pressed-steel box are removable and can be equipped with plates for suitable knockouts to fit any wiring condition.

The plunger switch has the switch gear inclosed in a cast metal casing and, as in the case of the pressed-steel type, the mechanism is operated from the outside of the box. The switch mechanism is of the quick make-and-break type and when closed a gasket in the lid makes the box fire- water- and fumeproof, so that installations may be made where water, fumes and dust exist without injury to the working parts of the switch. These switches are so constructed that the covers cannot be removed when the switch is in the "on" position. Neither can the covers be closed after opening until the mechanism is brought to the "off" position. This arrangement has been worked out so as to obviate the possibility of short-circuits in dangerous atmosphere in the process of opening and closing the switches.

This switch has its applications wherever safety is considered as a factor in the operation of electrical apparatus. It is worthy of note that liability insurance companies consider the safety value of this switch in computing premiums for such insurance. In general it meets the requirements for a safe, foolproof, efficient and economical inclosed switch.

Safety Work of the Sloss-Sheffield Steel and Iron Co.

By B. M. Starnes*

SYNOPSIS—Safety in the South is young. A safety department organized less than a year ago in a company employing over 6,000 men has been highly fruitful.

There is more to the business of mining coal,
Than shoveling lumps from a murky hole:
And health and content in a thousand ways
Add weight to the statement that "safety pays."

The safety movement in the South has made more progress during the past 12 months than ever before, many of the large corporations taking this work up in earnest, sparing no expense.

The Safety Department of the Sloss-Sheffield Steel and Iron Co. was organized on Feb. 1, 1916. This company, with headquarters in Birmingham, operating 16 plants, four furnaces, three ore mines and nine coal mines and coke batteries, employs about 6,200 men. Up to the time the Safety Department was started nothing had ever been done along this line.

Since this department was organized, at the furnaces hand rails have been placed along the trestles in the stock houses; wooden horses have been given the iron loaders to take the place of barrels, boxes, brick, etc., on which to place their running boards when loading cars; the correct method of lifting iron has been shown the loaders in order to prevent sprained backs; amber goggles have been issued to all men working around the furnace proper, and clear goggles to all others in hazardous occupations, for the protection of their eyes, and all blowing engines have been railed and screened for the protection of the workmen. The company is now conducting an experiment with an ore and coke buggy handle guard, which promises to practically eliminate accidents of this class in the stock houses. Measurements have been taken, and the material is on hand, for guards for all gears, belts, pulleys, etc.

Riding Trips Has Been Stopped

At the ore and coal mines trip riding by the men, a most dangerous practice, has been stopped. Most of the mines are of the drift type, but at slope mines a system of lanterns, a special lantern with a special red globe, attached to the front of every trip going in and coming out has been installed. On a straight haulway these lights, burning a light signal oil, can be seen for half a mile.

In 1915 the company had four fatal and about 20 trivial accidents on the slopes, but since these lights have been installed not even a single trivial accident has occurred.

At the coke ovens many accidents occurred as a result of the crust breaking through and the party getting burned, many seriously. It had been the custom for the pullers, when going from one side to the other, to cross over the top of the ovens. This practice has been stopped and the drawers must now go around the ovens. Since this new practice has been in vogue only one accident of this kind has occurred. Goggles have been issued to all who needed them.

An experiment is also being made with a wheelbarrow handle guard and the results, so far, have been good.

Only two of the coal mines contain gas, and at these mines five rescue helmets have been purchased, there being a trained rescue team at each operation.

So far, little has been done toward sanitation, though sanitary closets have been installed throughout some camps and their installation at all plants is contemplated shortly. A number of water analyses have been made, and at two places where the water contained typhoid germs, modern filtration plants with a capacity of 100,000 gal. each were installed and the water mains connected thereto, distributing the filtered water throughout the camps. Every camp is periodically cleaned up, all trash, tin cans, etc., being removed and burned.

First-aid work was taken up last spring at several of the plants and at the big first-aid contest held in Birmingham on May 27, in which about 60 teams competed, two of the Sloss-Sheffield teams, one from Cardiff and one from Bessie, tied for third place with an average of 98 per cent. In order that both teams might share the honor, the Sloss company duplicated the prizes which had been offered by the Association for third place—$5 to each member of the teams as well as a gold medal. In July when the troops were preparing to go to the border the Government requested Alabama to raise a company of first-aid men, which was done. Six men from the Sloss company volunteered, and like many other concerns in the district, the firm continued their salaries. When the men were divided into teams these six men were appointed captains of the teams. These men have also been selected as a team to accompany a batallion of Alabama troops now mobilized at Montgomery to attend the state fair to be held in Birmingham in October. This team is to demonstrate first-aid work at the fair, and the Hospital Corps selected the best six men it had to represent it. This is a record in first-aid work of which the Sloss company is justly proud.

It has been found rather a hard matter, however, to keep up interest in the first-aid work between times, and along this line any suggestions will be gladly received.

Safety Discussions Encouraged

The Sloss company is a member of the Alabama Safety Association, an association for the promotion of safety in industry, and it encourages its men to attend the meetings of the organization held each month, where safety ideas are discussed. It is also a member of the National Safety Council, and at each of the plants, as well as at the general office, a bulletin board is installed where the National Safety Council's weekly posters are placed. They attract a great deal of attention, and the company is inclined to believe they are helping to reduce accidents.

It is also the company's idea in educating the individual along safety lines, to give lectures on the subject illustrated by a moving picture machine. In order to

*Manager, Safety Department, Sloss-Sheffield Steel and Iron Co., Birmingham, Ala.

make it diversified, and not all business, to encourage the whole family to come, a comedy or two will be run between the safety films. It is believed that this will draw and hold a crowd.

A few actual accidents, caused either by carelessness or through wilful violation of the safety rules of this company are enumerated below:

At one plant recently, a miner drilled and loaded eight holes. The rule of the company is that not more than four holes in coal and one in rock shall be loaded at one time. Two of his shots exploded satisfactorily, the balance blowing out, filling the entire entry with bad air from which several men were made sick. This man violated the rule.

Recently two men working in the same room tamped two holes and cut their fuses shorter than the rules of the company permit. They did not have time enough to get away when the shots exploded and several flying rocks struck them.

At one plant a craneman was loading material into a car, the crane being on a trestle. He dogged only one side of the crane, the side from which he was lifting. The master mechanic passed by and told him to dog the other side of the crane, which he said he would do, the necessary dogs being on the crane at the time ready to be attached. He failed to do this and in less than 10 min. the crane was pulled off of the trestle by the lifting stress and the craneman was killed.

At a certain plant a young boy went into the hoisting engine room. He had gloves on. He put his hand on the cable and it caught his glove, and although the resulting accident was not fatal, he will be a cripple for the balance of his life. In the first place this boy had no business in the engine room; in the second place he had no right to fool with the rope; and in the third place, even had he had business in the room and even had he been attempting to fix the rope in the discharge of his duty, he should not have had his gloves on.

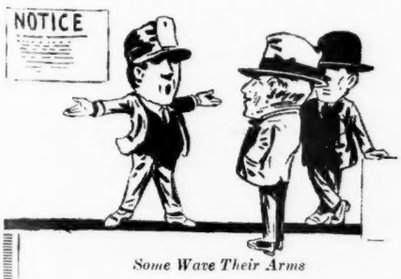
The safety work this year has reduced payments in settlements and litigations about 50 per cent. compared with last year. The fatal accidents, so far this year, have been 5 as against 9 during the same period last year, and the serious accidents have been reduced approximately one-third under last year.

I have had in this short description to touch ground only in high places, but I have tried to give a rough outline of some of the things the company is doing. The work in this company has just started and it hopes to accomplish much more in the future.

Conveyors and Coal Product

That a considerable saving may be effected in the winning of certain seams of coal by the employment of conveyors, was shown by P. E. Smallwood before the North of England branch of the N. A. C. M. A greater output per miner per shift also results. At Garesfield colliery the number of tons mined per man per shift and put onto conveyors is just under 4 as against 2¼ in room-and-pillar work.

At Chopwell colliery in seams varying from 20 in. to 3 ft., the output per miner per shift with conveyors is 4¾ tons. The first mechanical conveyor in England was started at Langley Park colliery, where thousands of tons of coal have been won by conveyors from seams which had hitherto been looked upon as unprofitable and valueless from a commercial standpoint.



Some Wave Their Arms

Safety First

By RUFUS T. STROHM

Written Expressly for Coal Age

There Must Be Nothing of Weakness or Wavering

HERE is a subject that bobs up repeatedly,
Claiming attention where miners convene;
Some wave their arms and expostulate heatedly,
Others discuss it with faces serene.
No one can honestly say that it's silliness,
Seeing that safety and comfort are kin,
So, when its friends meet resistance or chilliness,
Let them examine the way they begin.

Maybe a higher-up, quoting the minister—
"Do as I tell you, but not as I do"—
Sets an example that's vicious and sinister,
Sure to be aped by the laboring crew.
So, if the men become mocking or scurrilous,
Treating with banter or tolerant grin
All of the plans for evading the perilous,
That is a profitless way to begin.

NOTICES, posters, and signs painted luridly,
Warning Italian, Greek, Polack, and Hun,
Help in the spread of the movement, assuredly,
Yet there is plenty of work to be done.
Make every man, from the highest authority
Down to the poorest and lowliest Finn
Show that he's striving to help the majority;
That is the logical way to begin.

There must be nothing of weakness or wavering,
Only a strict hewing close to the line,
Not a suspicion of shielding or favoring
Any transgressors from office or mine.
Rules that are simple, explicit, and sensible,
Framed that the worker may keep a whole skin,
Careless infractions made quite indefensible—
That is a mighty good way to begin

Keystone Coal and Coke Co.'s Fifth Annual First-Aid Meet

SYNOPSIS—The Keystone company is one of the more active concerns in mine-rescue and first-aid work. After five years' endeavor in this field, its teams have attained a high degree of efficiency. The results of the recent meet are given herewith.

The fifth, and probably the most successful first-aid meet of the Keystone Coal and Coke Co., was held at Greensburg, Penn., on Sept. 2. This company, employing some 4,000 people, is most progressive in matters of first-aid, and its efforts in this direction are of more than ordinary interest.

The first and leading prize competed for is the L. B. Huff First-Aid Efficiency Cup, which was presented by the now deceased president of the company at the first contest five years ago. The cup goes to the winning team each year, and its name, together with those of the individual members, is engraved upon it. Should any team succeed in capturing the cup for three consecutive years it is to become the permanent property of that team. In addition to this cup General Superintendent H. F. Bovard offered a prize of a gold watchfob. There also were awarded several hundred dollars in cash prizes.

Order of Events

The following was the order of events:

1. Treat fracture of the pelvis with a compound fracture of left leg between knee and ankle, blood gushing; also scalp wound on top of head and fingers of left hand burst; place on stretcher, and transport 25 ft. Time, 15 min.
2. Treat fracture of spine in middle of back and simple fracture of right femur bone, also punctured wound over left eye. Place on stretcher and transport 25 ft. Time, 15 min.
3. Treat compound fracture left femur bone with blood oozing; compound fracture of left arm between wrist and elbow and broken right collar bone. Place on stretcher and transport 25 ft. over obstacle. Time, 10 min.
4. A man comes in contact with a live wire; show three methods of rescue; after he is rescued from the wire he is found to be unconscious and his throat and upper chest and palms of both hands are severely burned. Give him the proper treatment, place on stretcher and transport 25 ft. Time, 12 min.
5. A miner is overcome with afterdamp and suffering from simple fracture of left collar bone and simple fracture of right thigh and compound fracture of right forearm near wrist. Treat, place on stretcher and transport 25 ft. over obstacle. Time, 15 min.
6. Special one-man event, for purpose of determining proficiency in use of roller bandage. Start at toes on right leg, dress to point 6 in. above the knee. Time, 5 min.
7. Treat a man who has had his right foot split open to the instep, also compound fracture of left femur bone, severe laceration of right ear, compound fracture of left forearm between wrist and elbow, lacerated wound on top of head

VIEW OF GROUNDS, SHOWING THE 30 TEAMS IN COMPETITION

FIRST-AID TEAMS OF THE K. C. & C. CO., ALL EQUIPPED WITH ELECTRIC CAP LAMPS

KEYSTONE COAL AND COKE CO., FIFTH ANNUAL FIRST-AID MEET, GREENSBURG, PENN., SEPT. 2, 1916

Teams Contesting	Order On Program	Per cent. Attained	Rank	First Event: Time	First Event: Discount	First Event: Cause for Discount	Second Event: Time	Second Event: Discount	Second Event: Cause for Discount	Third Event: Time	Third Event: Discount	Third Event: Cause for Discount	Fourth Event: Time	Fourth Event: Discount	Fourth Event: Cause for Discount	Fifth Event: Time	Fifth Event: Discount	Fifth Event: Cause for Discount
* Keystone shaft fire bosses	20	99.8 Cup	1st	9	1	Lack of neatness	10			10			10			10		
Claridge	29	99.8	1st	9			14			12			9			10	1	Awkward handling of patient on stretcher
Huron	16	99.6	2nd	14			10			10	2	Tight tourniquet when not required	10			11		
Keystone shaft drivers	17	99.6	2nd	12			12	1	Captain's failure to command men properly	11	1	Not taking care of shock	9			11		
Sewickley outside	25	99.6	2nd	9			15			8			9	2	Failure to entirely cover wound	8		
Keystone shaft tipple	18	99.4	3rd	9			11			10	1	Not taking care of shock	9			10	2	Captain's failure to command men properly
Keystone shaft inside-A	19	99.4	3rd	10	1	Loose or "granny" knot	13	2	Awkward handling of patient	12			9			12		
Keystone shaft inside-B	22	99.4	3rd	10			11	1	For not taking care of shock	11			10	2	Awkward handling of patient on stretcher	12		
Arona inside-A	27	99.4	3rd	7			11			10	1	Loose splint	8	2	Failure to entirely cover wound	11		
Arona inside-B	30	99.4	3rd	10			15			13			11	2	For wrong artificial respiration	12	1	Awkward handling on stretcher
Carbon	11	99.0	4th	16	5	Not stopping bleeding	9			10			8			10		
Madison	28	99.0	4th	8			12			11			9	5	Wrong artificial respiration	12		
Sewickley inside-C	23	98.8	5th	8			14			9	2	Failure to entirely cover wound	10	2	For not doing most important thing first	8	2	For not doing most important thing first
Sewickley inside-A	21	98.6	6th	10			11	5	Failure to be aseptic	12			10	2	Loose or "granny" knot	11		
Greensburg No. 3	12	98.6	6th	15	2	Captain's failure to command men properly	12			11			9			12	5	Not taking care of shock
Crows Nest outside-A	4	98.6	6th	10			10			8			8	7	Failure to be aseptic and failure to entirely cover wound	10		
Greensburg No. 1	10	98.4	7th	14			10			10	2	Loose splint	9			11	6	Not taking care of shock; awkward handling of patient; not entirely covering wound
Salem-A	14	98.2	8th	12	4	Loose or "granny" knot	10			9			10			11	5	For not taking care of shock
Crows Nest outside-B	3	98.2	8th	9			10	2	Loose or "granny" knot	8			9	7	Failure to be aseptic and captain's failure to command men properly	9		
Sewickley inside-B	24	98.2	8th	10			11			10	2	Failure to entirely cover wound	11	5	For wrong artificial respiration	9	2	For not doing most important thing first
Crows Nest inside-B	5	97.8	9th	10			8	4	Captain's failure to command men properly; awkward handling of patient	9	5	Failure to be aseptic	8			10	2	Captain's failure to command men properly
Salem-B	13	97.8	9th	13	4	Loose or "granny" knot	9			10	2	Tight tourniquet	10			10	5	For not taking care of shock
Sewickley inside-D	26	97.4	9th	8	2	Failure to entirely cover wound	12			12	6	Wrong artificial respiration; not doing important thing first	9			10	5	Wrong artificial respiration
Hempfield No. 1 inside-A	2	97.2	10th	8	2	Not doing most important thing first	8			8	2	For captain's failure to command men properly	9	10	For wrong artificial respiration; failure to be aseptic	8		
Greensburg No.2	9	97.0	11th	13			9			8			7	10	Wrong artificial respiration; not aseptic	9	5	Not taking care of shock; awkward handling of patient
Crows Nest inside-A	6	96.6	12th	14			11	7	Captain's failure to command men properly; not giving proper support to femur bone	10			9	10	For wrong artificial respiration; failure to be aseptic	10		
Crows Nest inside-C	8	96.6	12th	13	4	Improper aseptic treatment and awkward handling on stretcher	10			10	4	Loose bandage; awkward handling of patient	9	9	Not taking care of shock; failure to be aseptic; subject lends assistance	11		
Hempfield No. 1 inside-B	1	96.4	13th	9	4	Not doing important thing first and lack of neatness	8	2	Awkward handling of patient on stretcher	8	2	Awkward handling of patient on stretcher	8	10	For wrong artificial respiration; failure to be aseptic	8		
Keystone shaft shop	15	96.0	14th	11			15	2	Failure to entirely cover wound	11	4	For wrong artificial respiration	9	2	For wrong artificial respiration	13	12	For wrong artificial respiration; not aseptic; captain's failure to properly command
Greensburg No. 4	7	95.0	15th	14	13	Loose or "granny" knot; failure to be aseptic; captain's failure to command men properly	8			7	4	Loose bandage	8	8	Wrong artificial respiration; lack of neatness; subject lends assistance	8		
Average		98.5		10.8			10.9			9.1			9.0			10.0		

* Keystone shaft firebosses awarded cup by vote of judges over Claridge, with whom they contested, in seventh event.

ONE OF THE COMPANY'S MINE-RESCUE TEAMS WITH FULL EQUIPMENT

and simple fracture of jaw. Place on stretcher. Time, 15 min.

The teams competing, with the rating and discounts received by each, are given in the table appearing on the preceding page.

On the grounds the company had erected a white canvas building in which a demonstration of work in noxious gases was given for the benefit of about 5,000 local residents and various mine officials from different sections of the country. The mine-rescue team, shown in the accompanying illustration, worked for an hour and a half in this place.

It should be understood that the 180 first-aid men and the 10 mine-rescue men who participated in the meet are only a portion of the organization formed by the company for first-aid work. There are 52 employees of the company who have completed a course of training in the use of modern mine-rescue breathing apparatus and have Government certificates of efficiency. The company also has 350 actual trained first-aid men.

Reading Co.'s First-Aid Meet

SYNOPSIS—The Philadelphia & Reading Coal and Iron Co. held its annual combined elimination and final first-aid meet at Lakeside Park, East Mahanoy Junction, Penn., Sept. 16, at which 74 teams presented themselves as candidates for leading honors. After the elimination events the teams which made the best showing in each of the 10 different districts competed in the finals, and Shenandoah City, outside team, won first place.

The Philadelphia & Reading Coal and Iron Co. held its most successful meet on Saturday, Sept. 16, the place of meeting being, as usual Lakeside Park, East Mahanoy Junction, Penn. This, the twelfth annual competition, brought out more guests than any previous event of like character, there being 1,925 persons present at the noonday spread. There were 74 teams in the contest—the same number as competed last year.

To serve the guests 185 waiters were brought from Philadelphia the day before the event. The service was excellent, such linen, silver and glass being provided as would be found at a first-class hotel, and the menu accorded with the table furnishings.

In the elimination contests the teams of each district competed against each other, each district being given a special problem. Thus District No. 1 comprised Hammond Inside No. 1, which made a percentage of 99+; Bast Outside with 98.5; Hammond Outside with 98+; Potts Outside with 98; Hammond Inside No. 2 with 98; Potts Primrose, with 97.5; Bast Second Lift with 97; Bast Third Lift with 96, and Potts, Mammoth, with 96—. The test was in dressing a compound fracture of the skull and a simple fracture of the jaw, using two 2½ in. gauze bandages and gauze, the time limit being 6 min.

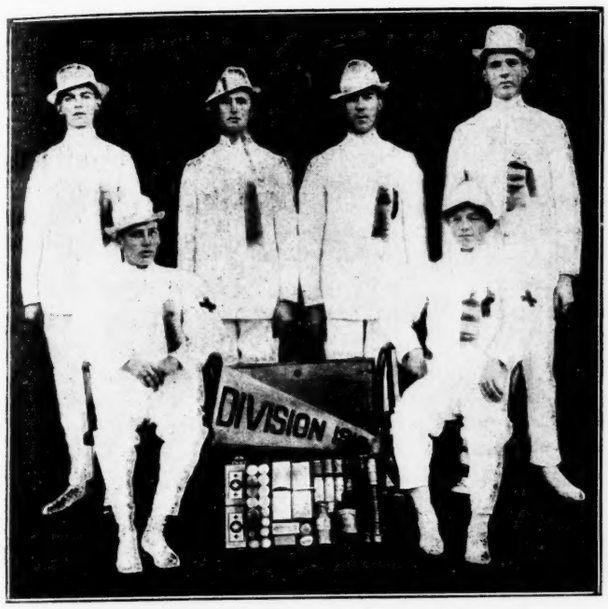
Thus Hammond Inside No. 1 represented District No. 1 in the finals. This event was a demonstration of artificial respiration by the Shaefer and Sylvester methods and using the pulmotor, inhalator and oxygen trunk, the time allowance being 10 min. The rating of the teams in this final contest was as follows: Shenandoah City Outside, 99.3; Wadesville, 98.9; North Franklin, 97.6 Brookside, 97.5; Maple Hill Outside, 97.5; Mahanoy City Inside, 97.4; Pine Knot, 97.4; Gilberton, 97.2; Hammond, Inside No. 1, 97; Locust Spring Outside, 96.7.

The Shenandoah City colliery outside team is comprised of Edward Lawlor, William O'Neill, Elmer Davis, Edward Williams, Con Shields and Donald Boyd.

The judges were Dr. S. P. Mengle, of Wilkes-Barre, Dr. D. S. Marshall, of Ashland, and Dr. T. B. Rodgers, of Pottsville, the latter two being surgeons of the Lehigh Valley Coal Co.

W. J. Richards, of Pottsville, Penn., as president of the Philadelphia & Reading Coal and Iron Co., was host, being assisted by E. T. Stotesbury, of Philadelphia, the chairman of the Board of Directors, and Mrs. Stotesbury, who made her especial interest nearly 100 ladies, the wives and daughters of officials.

Among the guests were Morris Williams, president of the Susquehanna Coal Co., and M. F. Burns, of New



WINNERS OF THE READING MEET

York, one of the largest coal dealers in the country. All the superintendents and officials of both the "Reading" and the Susquehanna were present as well as several independent coal operators, lawyers, surgeons and clergymen.

President Richards addressed the prize winners saying:

This work is what you are doing every day in the mines. It is the quick work of rescue for the men in extremity. There is no way to measure what has been done in the last year. It cannot be measured in words. You are doing your work faithfully and well, and you are always ready and willing to aid your fellow-workmen. It is needless to say that I am proud of the work you have done. I am proud to know that the Coal and Iron Co. can present every day a body of men who can care for the men injured in the mines.

The guests were taken to Lakeside in special trains from many points. One special of 14 coaches from Pottsville took Reading officials, while another from Shamokin and the vicinity transported Susquehanna officials. Mr. Stotesbury and his party, in his private train, arrived the night before, Coal and Iron policemen guarding the train during his stay.

Blackdamp in Mines

The Bureau of Mines, Department of the Interior, in pursuing investigations looking to greater safety in mining, has analyzed samples of the air in many different coal mines in the United States, and has studied the analyses. The results of one phase of this study are presented in Bulletin 105, "Blackdamp in Mines," by G. A. Burrell, I. W. Robertson and G. G. Oberfell. This study shows how atmospheric air, after entering a coal mine, loses oxygen and gains carbon dioxide with resulting formation of so-called blackdamp. The report also discusses the effects of the constituents of blackdamp on men, on the burning of oil and acetylene lamps and on the explosibility of methane.

The authors state that the term blackdamp was and still is widely used to designate accumulations of carbon dioxide, but a more exact definition of blackdamp, as Haldane, the English physiologist, has pointed out, is an accumulation of carbon dioxide and nitrogen in proportions larger than those found in atmospheric air. The authors prefer Haldane's definition.

The bulletin treats on the comparison of atmospheric air with mine air, effects on man of variations in composition and amount of air, the effect of temperature and moisture on man, the action of oxygen in coal, the influence of moisture on rate of absorption of oxygen by coal, the effect of lowering oxygen and raising carbon dioxide content on explosibility of methane-air mixtures, and the consumption of oxygen and the production of carbon dioxide by man and by lights.

Copies of this bulletin may be obtained free of charge by addressing the Director of the Bureau of Mines, Washington, D. C.

To Plant Trees in Wilderness

Paul T. Cosgrove, in charge of the Homer City Coal Co.'s operations at Homer City, Indiana County, Penn., proposes to reforest some of the unused land owned by the coal corporation. To this end he has been in conference with District Forester Ludwig, and it is said a big tract will be planted next spring. There are many square miles of coal-land surface in Pennsylvania which burns over every year and which might profitably be set to mine timber. It would soon grow to maturity if properly cared for and safeguarded from fire. At present a crop of blackberries is the only economic product of the hills.

Ebensburg First-Aid Contest

At Ebensburg, the county seat of Cambria County, a successful first-aid contest was held on Sept. 4 among the employees of the Argyle Coal Co., the Mountain Coal Co. and the Tunnel Coaling Co. Griffith Field was the scene of the contest.

The interest was considerable, as it was known that the winning team (which proved to be team No. 4 of the Tunnel Coaling Co.) would be sent to Detroit, Mich., to enter the all-America contest to be held on Oct. 20 at the fifth annual Safety Congress of the National Safety Council.

The Tunnel Coaling Co. team, which took first honors, secured a rating of 99.8 per cent. No. 9 team of the same company from Nettleton made 99.6 per cent. There were three teams with a percentage of 99.06, and another contest was held to pry these close competitors apart. They dressed a patient suffering from a foreign body embedded in the left eye and for a simple fracture of the left arm. Again the Tunnel Coaling Co. secured a place, No. 8 team this time being the preferred competitor.

A souvenir gold watch fob was given to every member of the competing teams. The individuals in the winning team will also be granted medals by the American Red Cross. Those who were members of the second and third teams will receive certificates of competency from the same source. Also, the men in the team that took second place received gold watches, and those in the team that was third in the running were presented with pearl-handled pocketknives.

Albert M. Allen, of the state workmen's compensation fund, presented a special silver cup for which H. M. Wilson, of the Associated Companies, prepared a special event that was judged by the same physicians who officiated in the regular contest assisted by four mining engineers.

This special prize was won by team No. 9, of the Tunnel Coaling Co., the one that was worsted by such a narrow margin in the first bout and was thereby deprived of the pleasure of a trip to Detroit.

As a Sample of Coal Loses Moisture, its B.t.u. "as received" value correspondingly rises, with the result that the price for delivered coal determined on the "as received" value is, with rare exceptions, higher than that warranted by the quality of the coal at the time of weighing. As a general statement, payment based on the "as received" B.t.u. value will be higher than warranted, unless the sampling and laboratory work can be carried on under conditions that minimize moisture loss, as under freezing temperatures.

First-Aid on Vancouver Island

By James W. Jemson*

SYNOPSIS—Description of the initial first-aid meet on Vancouver Island. The contest aroused a great deal of enthusiasm among the general public as well as the miners.

The first annual first-aid competition to take place on Vancouver Island was given under the auspices of the Vancouver Island Mines Safety-First Association, and was held in Nanaimo on Labor Day, Sept. 5.

Two trophies were competed for, one being presented by the British Columbia Department of Mines, and the other, known as the Coulson Cup, by the late general manager of the Canadian Collieries Co. In addition to the trophies, medals donated by the Mines Department, and T. R. Stockett, general manager of the Western Fuel Co. of Nanaimo, were presented to the winning teams.

The contest aroused a great deal of enthusiasm not only among the miners of the district, but also among the general public, and the grounds were well filled throughout the afternoon, the weather being all that could be desired.

In addition to the first-aid contests there was a tug of war, the outcome of a dispute over the decision given at the miners' picnic in August. After a hard and strenuous pull, the South Side team again proved the victor.

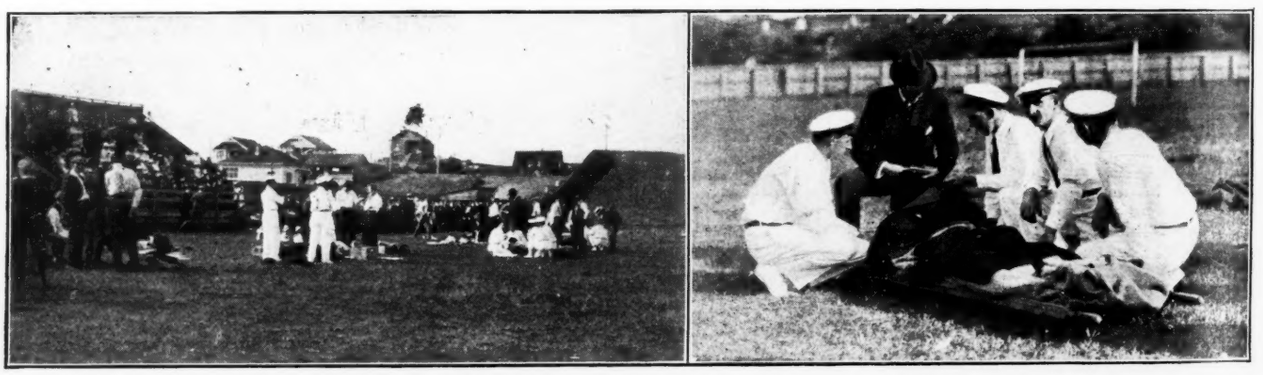
In the competition for the Department of Mines cup, which is emblematic of the championship of Vancouver Island, eight teams were entered as follows: Western Fuel Co., South Side and North Side; Extension No. 4; Extension No. 3; Extension No. 1; Beban; South Wellington and Vancouver-Nanaimo Coal Co.

In this event, which was very closely contested, the Vancouver-Nanaimo's team proved victorious, thereby becoming champions of the island, holders of the trophy and possessors of the gold medals donated by the association. The Extension No. 4 team was second, thus securing the medals donated by T. R. Stockett.

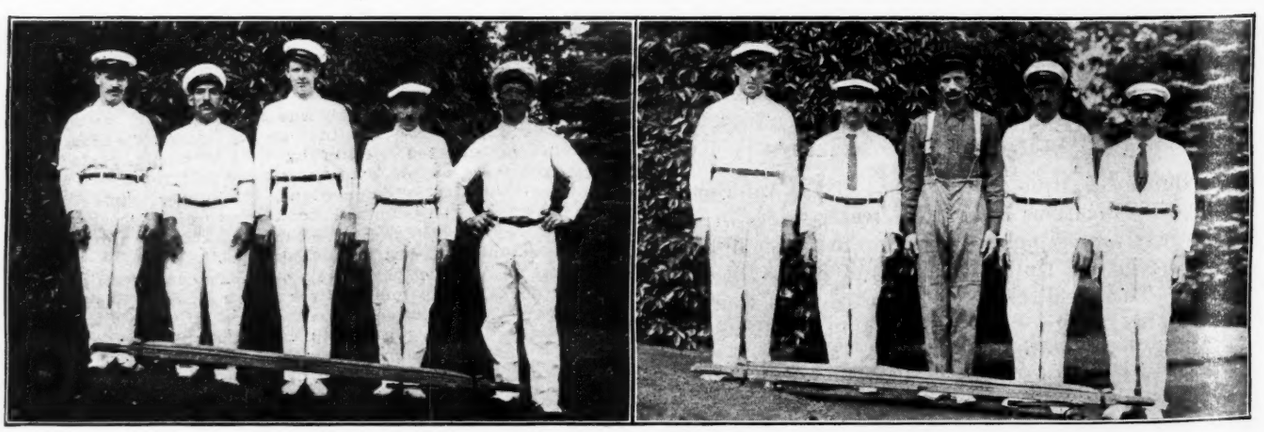
In the competition for the Coulson Cup, Extension No. 1 team proved victorious with the Vancouver-Nanaimo Co.'s team tying for second place.

In the evening a banquet was given in the Foresters' Hall, at which the cups, medals and prizes were presented to the victors. Speeches were made by Messrs. Cunningham, Michael and Fulton, and a fine musical program was rendered by Mrs. Freeman, and Messrs. Lewis, McAlpine, Connor, Davidson and Tappin.

A hearty vote of thanks was accorded all the competing teams, to Drs. Wilks, Luton and Emerson, for their kindness in judging the events, and last but not least to the donors of the prizes.



SCENE OF THE EVENT ON THE LEFT AND DOCTOR QUESTIONING A TEAM ON THE RIGHT



WESTERN FUEL CO.'S TEAMS. NORTH SIDE ON THE LEFT AND SOUTH SIDE ON THE RIGHT

*Nanaimo, B. C., Canada

THE TUG-OF-WAR IN WHICH THE SOUTH SIDE MEN PROVED THEIR SUPERIORITY FOR THE SECOND TIME

The test that was given for the Department of Mines' trophy was as follows: A man has fallen from a trolley wire 20 ft. above the ground, sustains a compound fracture on the left side of the head; he is insensible; right hand and forearm severely burned; dislocated left elbow and injured pelvis. The accident happens 5 mi. from a doctor, and the nearest telephone is half a mile away. The test for the Coulson Cup was as follows: A man has been run over by a locomotive, severing the right foot at the ankle; internal hemorrhage; improvise bandages and pack patient by any other means than the regular stretcher. Hospital 50 yd. away.

Temple Coal Co.'s Contest

SYNOPSIS—The Temple Co.'s interest in safety work has so far not been given much publicity. On Sept. 9 it held a contest at which eight skilled teams participated.

The Temple Coal Co., which was formerly the Temple Iron Co., is a pioneer among the anthracite concerns in the propagation of first-aid. It entered the movement a dozen years ago. Up till the last two years the Temple teams did not hold a meet of their own, but entered the contest held at Valley View by the American Red Cross.

When the European war absorbed the interest of the society so that the intercompany contest was abandoned, the Temple concern instituted an annual contest for its own employees. This year S. B. Thorne, of New York, the president of the Temple Coal Co., stimulated interest by presenting as a prize what is probably the most handsome trophy ever offered for contest at a first-aid meet. It is a gold-lined, silver cup that stands 14 in. above its pedestal.

OUTSIDE MEN OF LACKAWANNA SECURE TROPHY

The winning team was composed of outside employees of the Lackawanna colliery at Oliphant. It holds the cup for one year. It is noteworthy that this same team holds possession of the Captain John B. Markle cup, having won that trophy at the last Red Cross contest. The men in both competitions, however, were not identical. Only Thomas Maggs and Harry Saxe assisted in the winning of both trophies.

There were only eight teams in all, the Temple Coal Co. being one of the small companies of the anthracite region; for all that it was long regarded as the keystone of the anthracite arch. The teams represented five collieries of the company. There would have been one more team but for the lack of men at the Northwest colliery, which precluded that operation from entering any contestants. A large crowd evinced the wholesome interest shown in first-aid work by the mine employees. The Temple Coal Co. furnished a band concert for their entertainment.

The director of the meet was Dr. F. F. Arndt, a pioneer in first-aid work who has for several years had charge of that work for the Temple Iron Co. He also directs that of the Pennsylvania Coal Co. and the Hillside Coal and Iron Co. The compensation act created a medical department of which he also has supervision. With this distinguished figure in first-aid activity were associated J. G. Angwin and J. P. O'Donnell, as secretaries, and Drs. S. L. Underwood and C. W. Prevost, of Pittston, and Dr. F. J. Bishop, of Scranton, as judges.

CONTEST COVERED ALL PHASES OF FIRST-AID

The contest for the president's cup included three events, each for a full team of five men. All the problems presented three separate phases of first-aid work: The treatment of bleeding from arteries, the treatment of fractures and the treatment of open wounds, burns, sprains and dislocations. The prizes were awarded on the general average for the three events.

The results of the contest follow, with the record for each event and the general average for all three.

Team	1	2	3	General Average
Lackawanna, outside	100	100	100	100
Sterrick Creek No. 2	98	100	100	99⅓
Mt. Lookout, inside	95	100	98	98⅓
Lackawanna, inside	95	100	98	97⅔
Harry E. Colliery	95	95	100	96⅔
Mt. Lookout, outside	90	95	100	95
Forty Fort, inside	90	95	98	94⅓
Sterrick Creek No. 1	93	90	100	94⅓

The members of the two best teams are:

Lackawanna, outside employees—Jerry Rosengrant, captain; Thomas Maggs, Harry Saxe, Arthur Tinsley and Thomas Lewis; James Callaghan, subject. Sterrick Creek, Dunmore No. 2 vein—Martin Rodecky, captain; Oladino Perrine, Joseph Podrosky, Joseph Mackey and Mike Para; Joseph Zabada, subject.

ONE-MAN EVENT WAS POST-ELIMINATION CONTEST

The participants in the individual contest were the men from the respective collieries who had shown most proficiency in the June preliminary contests. It was a one-event contest, the following prizes being offered: First prize, Howard gold watch; second, solid gold chain and charm; third, gold cuff links; fourth and fifth, gold stick pins. The problem given was as follows:

Treat a compound fracture of the left lower jaw and a severe injury to the right eye; dress a wound 8 in. long, running from the top of the shoulder downward over the shoulder blade, starting halfway between the neck and the summit of the shoulder. Treat a badly burned hand. Apply tourniquet wherever possible to the left arm and leg.

The results of the individual contest follow:

(1) Lawrence Smith, Mt. Lookout, 96; (2) Isador Hochreiter, Harry E, 95⅞; (3) Philip Williams, Forty Fort, 90; (4) Edward Van Duzer, Lackawanna, 89⅞; (5) Martin Rodecky, Sterrick Creek, 86⅞.

John R. Wilson, chief counsel to the Temple Coal Co., awarded the prizes, complimenting the men on their earnestness, efficiency and humanitarian efforts.

Boswell, Penn., First-Aid Meet

SYNOPSIS—Twenty-eight teams representing twelve companies contested at Boswell for leadership in first-aid in Somerset County, Penn. As a result two teams will be sent to seek honors at the Detroit meet of the National Safety Council.

More than a thousand miners training for practical first-aid to the injured; several elimination contests conducted by companies to select teams for the principal meets: more than four hundred miners competing in intercompany contests and two winning teams awarded the trip to the National First Aid Meet of the National Safety Council—this is the proud record of the State Young Men's Christian Association of Pennsylvania for the past season.

The last contest was the Fourth Annual Somerset County First-Aid Meet held at Boswell, Penn., Sept. 2, 1916, under the direction of George B. Landis, industrial secretary of the State Young Men's Christian Association. Twenty-eight teams from twelve different companies and from as many different towns lined up on the field in accordance with numbers previously drawn by lot by the captains. The companies represented were: Atlantic Coal Co., Boswell; Brothers Valley Coal Co. (4 teams), Macdonaldton; Consolidation Coal Co., Meyersdale, Pine Hill, Wilson Creek, Jenners, Acosta and Shaft 123; Grazier Coal Co., Holsopple; S. M. Hamilton & Co., Wells Creek; Jenner-Quemahoning Coal Co. (2 teams), Jerome; Merchants Coal Co. (4 teams), Boswell; Meyersdale Fuel Co., Meyersdale; Quemahoning Coal Co. (2 teams), Ralphton; Quemahoning Creek Coal Co., Somerset; Randolph Coal Co., Randolph; Victor Coal-Mining Co., Holsopple.

EXECUTING—"PREPARE TO LIFT, LIFT"

A panoramic picture of the 168 contestants, officials and judges was taken and the one-man and two-man events

EDGING AROUND PAST A NARROW PLACE

were run off in the morning. To give one judge to each team it was necessary to work odd-numbered teams first and the even numbered afterward. The judges were 20 doctors from mining towns, and were selected by the American Red Cross. Though they had been instructed to judge closely, eight men tied in the one-man event and seven tied in the two-man event. Other company doctors were present, but because of their connection with competing teams were not available as judges.

It was found that four teams were tied for third place. On working off these ties, two teams made a score of 100 per cent. This good showing is owing in part to intensive training of the teams for ten days previous to the meet by George McCaa and Robert Seip, of the United States Bureau of Mines.

At the close of the day Frank W. Cunningham, the state mine inspector, and the chairman of the committee on arrangements, took charge of the exercises. George B. Landis presented the prizes. The first prize for full teams was a silver cup donated by the E. I. du Pont de Nemours Powder Co. Other prizes were first-aid material by Johnson & Johnson, Bauer and Black and the Mine Safety Appliance Co.; lamps by John Simmons Co.; alumi-

TWENTY-EIGHT TEAMS AND THE FRIEDENS CONCERT BAND LINED UP

num buckets, tools and electric searchlights. The winners in each event received American Red Cross medals and those taking second and third places received certificates. The averages of the teams for the three events worked out as follows:

		Per Cent.
1.	Consolidation Coal Co., Pine Hill	99⅝
2.	Meyersdale Fuel Co., No. 2	99⅓
3.	Consolidation Coal Co., Acosta	99
4.	Consolidation Coal Co., Wilson Creek	99
5.	S. M. Hamilton Co., Wells Creek	99
6.	Merchants' Coal Co., No. 1, Boswell	99
7.	Merchants' Coal Co., No. 2, Boswell	98⅝
8.	Merchants' Coal Co., No. 3, Boswell	98⅛
9.	Victor Coal Co., Holsopple	98
10.	Quemahoning Creek Coal Co., Somerset	97⅝
11.	Grazier Coal Co., Holsopple	97⅜
12.	Consolidation Coal Co., No. 1, Jenners	97⅜
13.	Randolph Coal Co., Randolph	97⅜
14.	Merchants' Coal Co., No. 4, Boswell	97¼
15.	Jenner-Quemahoning Coal Co., No. 1, Jerome	97⅛
16.	Consolidation Coal Co., No. 2	97
17.	Brothers Valley Coal Co., No. 1, Macdonaldton	97
18.	Quemahoning Coal Co., No. 1, Ralphton	97
19.	Brothers Valley Coal Co., No. 2, Macdonaldton	96⅝
20.	Atlantic Coal Co., Boswell	96½
21.	Brothers Valley Coal Co., No. 4	96⅜
22.	Brothers Valley Coal Co., No. 3	96
23.	Consolidation Coal Co., No. 2, Wilson Creek	95
24.	Meyersdale Fuel Co.	95
25.	Quemahoning Coal Co., No. 2, Ralphton	95
26.	Jenner-Quemahoning Coal Co., No. 2, Jerome	94⅝
27.	Consolidation Coal Co., No. 1, Meyersdale	94½
28.	Consolidation Shaft, No. 123, Boswell	93⅛

DRESSING VICTIMS AFTER MINE EXPLOSION

After figuring the average in all five events, the medals of the National Safety Council were presented to the Pine Hill team, Consolidation Coal Co., its average being 99⅝ per cent. This team, having the highest average, will be sent by the Consolidation Coal Co. to the Detroit meet. It is understood that the Merchants Coal Co. will send its Orenda team No. 1, of Boswell, Penn.

The victorious Pine Hill team of the Consolidation Coal Co., which captured first place in the full-team event, was captained by George Beale and consisted of Eph

REPLACING WORK OF PARALYZED LUNGS

Pritts, Frank Snyder, Harry Minkemeyer, Fred Watkins, and Wade Coleman, patient.

Three team problems—one of them improvised—were given and worked out under the scrutiny of one or two judges. When ties had to be worked off more difficult problems were given and two or three judges were assigned to each team. Under this arrangement the one-man ties were quickly worked off and determined as follows: (1) Consolidation Coal Co., Meyersdale, team No 1, 100 per cent.; (2) Consolidation Coal Co., Jenners, team No. 1, 99 per cent.; (3) Jenner-Quemahoning Coal Co., Jerome, No. 2, 98 per cent.

In the two-man event, three teams tied a second time and after another problem stubbornly maintained the tie with a perfect score. Their standing was finally determined by lot: (1) Consolidation Coal Co., Jenners, team No. 1; (2) Meyersdale Fuel Co., Meyersdale; (3) Consolidation Coal Co., Pine Hill.

Addresses were made by E. E. Bach, of the Ellsworth Collieries Co.; H. M. Wilson, of the Associated Companies, and Dr. F. U. Ferguson, chief judge. Welfare work and especially first-aid, was the theme of these addresses. They emphasized not only the benefit conferred on the individual himself but his preparation by means of this training to help others in distress. The first-aid training indirectly if not directly promotes the safety-first movement. Coöperating in first-aid work employer and employee meet on common ground. Both are interested in the humanitarian effort to save life. Two speakers referred to the decreasing use of alcohol. Judges taboo its use as a stimulant after an accident. Safety-first prohibits it in mines and restricts its use in mining towns.

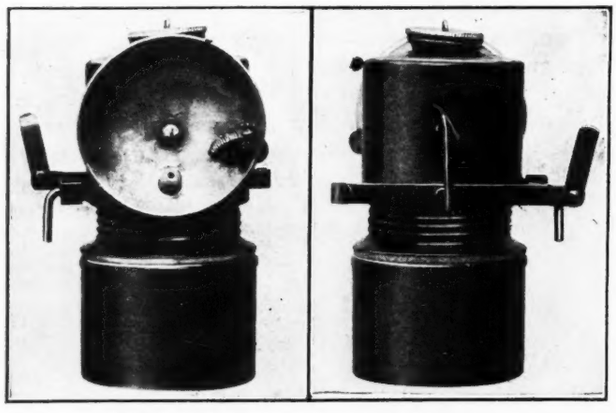
ON THE CONTEST FIELD IN THE BOSWELL, SOMERSET COUNTY, PENN., MEET

Improvement in Carbide Lamp

The carbide lamp illustrated herewith has many new features, perhaps the most interesting among these being the position of the water-feed regulator and the direction of the burner. The regulator of the water feed is a lever at the side of the lamp. When the lever is in its most upward position, the water feed is closed; when it is in the extreme downward position, the feed is wide open.

The burner instead of being placed in the center of the reflector is located near its base and directed upward so that the flames lie across the reflector instead of at right angles to it. All the light is therefore subject to this reflection, yet the angle of the burner is such that the flame does not impinge on the reflector and burn it.

For an engineer reading a vernier this arrangement of the flame would appear to have advantages over one in which the flame passes in a horizontal direction. He has always been wondering if by a chance misdirection the flame would impinge on the instrument and perhaps



FRONT AND REAR VIEW OF THE LAMP

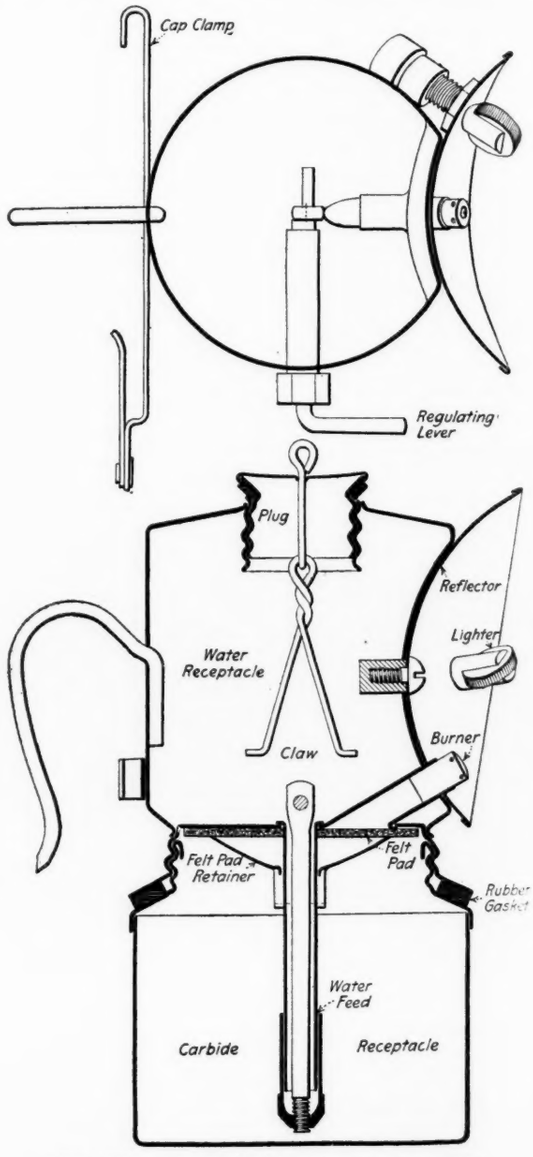
set fire to the vernier reflector, should it happen to be constructed of celluloid. He has also found it hard to read his instrument without singeing his eyebrows.

The manufacturers' directions suggest that the carbide receptacle be charged with 2 oz. of ¼-in. carbide. When filling the upper, or water, receptacle, the finger should be kept over the burner tip to keep water out. The first priming of the charge is secured by opening the feed to the wide-open position for about half a minute, when the escaping gas can be lighted either with a match or by passing the hand over the revolving lighter. After the light has burned about half a minute the water feed can be adjusted to the half-open or some satisfactory position according to the light desired, the former being the position recommended.

The use of too much water in this and other lamps causes the flame to blow and forces the gas through the vent in the water container with consequent loss of economy. However, it is sometimes necessary to provide the full feed so as to clear the drip cup from collected sediment.

Used with discretion the lamp will burn for four hours. The upper part of the lamp screws quite firmly onto the lower with a good solid gasket, in marked contrast to the flimsy connection which used to be considered satisfactory. In earlier days this gasket was one of the miner's most persistent troubles.

The opening to the water receptacle is closed by a screwed plug. The objection to such an arrangement is that the plug is apt to fall and be lost in a pile of rock when unscrewed. To avoid this fault the manufacturers have put on a retaining claw which passes through the gas hole of the screwed plug referred to. When



DETAILED SECTIONAL VIEWS OF LAMP

the plug is unscrewed the retaining claw attaching itself to the sides of the hole prevents the plug from falling, but the aperture is nevertheless wide open and permits an unrestricted filling of the water receptacle.

Occasionally, the felt through which the gas passes should be renewed. In fact all parts of the lamp can readily be removed and new parts furnished. The lamp has a dark enamel finish and is arranged with a cross-bar at the back which by means of a pivoted hook firmly attaches the lamp to the tin front of the miner's headgear so that it cannot jolt with wearer's stride.

The lamp weighs 6 oz. when empty. It is known as the Hoppe "Brite-Lite" miner's carbide lamp and is made and distributed by the Harker Manufacturing Co., 410 East Pearl St., Cincinnati, Ohio.

Lehigh Coal and Navigation Co.'s First-Aid Meet

FROM AN ANTHRACITE CORRESPONDENT

SYNOPSIS—At Lakeside Park the mine workers of the Lehigh Coal and Navigation Co. contest with each other each year for the first-aid championship. The districts contend annually for leadership in field and aquatic sports and a cup will be awarded for the best accident record of the year. The first-aid work was exceptionally fine.

The annual outing and first-aid contest of the mining department of the Lehigh Coal and Navigation Co. was held at Lakeside Park, Saturday, Aug. 26, and was one of the most successful if not the most successful event in the history of the company's first-aid work. It was particularly in striking contrast with the event of last year, but the difference was owing entirely to the courtesy of the weather bureau. Last year the first-aid competitions were marred and the ardor of the patients and their rescuers chilled by a cold rain which, however, gave way to clear skies and genial temperature for the sport contests in the afternoon. This year the weather conditions were ideal and the enthusiasm both for the more serious first-aid work and for the athletic contests was of the top-notch variety.

200-LB. MEN IN A 50-YD. DASH

FINISH OF THE 100-YD. DASH

The arrangements made by the special committees on transportation, first-aid, refreshments and sports were of the same character as the weather and everything went off according to a prearranged schedule with almost military promptness and precision. Upon the arrival of the special train bringing the various competitors and guests (about 800 in all) the field for the first-aid contests was found ready prepared in an immense oval in the center of which the Slavish band of Lansford dispensed excellent and appropriate music in the interims between events.

No time was lost in getting started and in less than half an hour from the arrival of the train the teams were ready for the pistol shot which indicated "go." Five problems out of ten on which the teams had been practicing were chosen by lot, the problems drawn being:

GENERAL VIEW OF THE FIRST-AID FIELD AT LAKESIDE PARK

A PANORAMIC VIEW OF ALL THE LEHIGH COAL AND NAVIGATION CO.'S EMPLOYEES

1. One-Man Event—Dress a foreign body in the right eye, simple fracture of left thumb, lacerations on left hip. Time, 5 min.

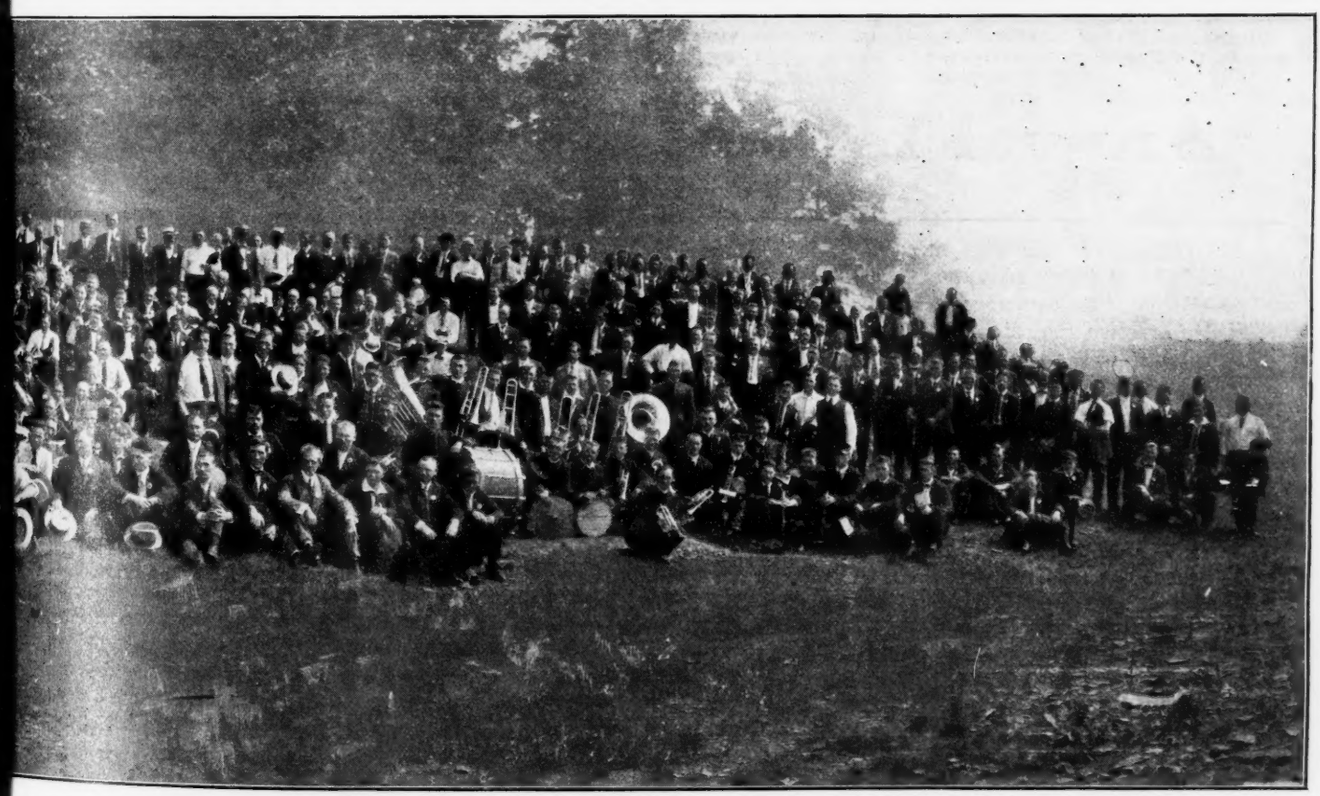
2. Two-Man Event—Dress lacerations of the back of the left hand, laceration of the scalp and a fracture of the right kneecap. Time, 5 min.

3. Team Event—Dress a simple fracture of the left forearm, compound fracture of the right thigh and a fracture of the lower jaw. Time, 8 min.

4. Team Event—Dress a compound fracture of the left upper arm, a compound fracture of the right wrist and lacerations back of the neck. Time, 8 min.

5. Team Event—Treat a person overcome by gas and having burns of the head, neck and chest, and of the arms from the hands to the shoulders. Artificial respiration for 1 min. Time, 10 min.

The excellence of the training the teams have had is attested by the fact that out of 28 contesting, 25 scored over



AND GUESTS WHO ATTENDED THE FIRST-AID CONTEST AT LAKESIDE PARK

95 per cent.; 8 made scores of over 98, and the first, second and third prizes went to teams scoring 99.3, 99.2 and 99.1 per cent. respectively. The prizes and the winning teams were as follows:

First prize, $25 in gold, individual silver medals and possession of the cup for one year—Won by Lansford No. 5 Shaft, Edward McDermott, captain.

Second prize, $15 in gold—Won by Hauto Washery, Morgan L. West, captain.

Third price, $10 in gold—Won by Rahn No. 11 Shaft, James Filer, captain.

After the regular first-aid program was completed a special lungmotor competition was held. This was won by Tamaqua No. 14 Shaft (Team No. 1), Christ Erbe, captain.

L. C. AND N. CO.'S EMPLOYEES IN WATER SPORTS—CHASING THE DUCK

The judges in the first-aid contests were Doctors J. J. Corrigan, of Hazleton; J. E. Wasser, of East Mauch Chunk; J. H. Behler, of Nesquehoning, and R. H. Kistler, W. H. Kastin, W. F. Ely and M. H. Newmuller, all of Lansford.

The water sports, which took place immediately after the first-aid contests, were: First, 50-yd. straightaway swim, won by Lawrence Hiles, of Nesquehoning; second, 300-yd. single-oar boat race, won by Fenton Gregory, of Lansford; third, 100-yd. straightaway swim, won by Daniel Helferty, of Cranberry; fourth, 400-yd. double-oar boat race, won by Howard Greenawald and Tony Zanin, of Tamaqua; fifth, chasing the duck, won by Charles Noble, of Lansford.

Then came luncheon in the grove punctually to the minute and served as usual, and as usually well, by Steward Edward Petzel, of the Old Company Club at Lansford.

Immediately after luncheon a quoit-pitching contest was won by the Nesquehoning district, and then the field sports, consisting of: 50-yd. dash (men over 50 yr.), won by Samuel Nevins, of Tamaqua; 100-yd. dash, won by George Jones, of Lansford; running broad jump, won by W. Richards, of Lansford; 50-yd. dash (men over 200 lb.), won by John E. Davis, of Coaldale; tug-of-war, won by Tamaqua team.

By winning the tug-of-war, the first 50-yd. dash, the double-oar boat race and coming in second in several of the other events, the Tamaqua district scored a total of 38½ points and won the silver cup, which is held for a year by the winning district until one district has won it three times, when it becomes the property of the district. Last year it was won by Lansford. This cup, together with the one in the first-aid contests, which Lansford also won, and one for the best accident record for the past year (winner not yet announced) will be presented at the annual banquet of the Panther Valley Mining Institute to be held later in the season and which is another enjoyable event.

Annual Indiana First-Aid Meet

By W. R. Simmons*

SYNOPSIS—In the meet recently held at Clinton, Ind., 29 teams of miners participated. Over two-thirds of this number were sufficiently proficient to receive a grading of 90 per cent. or better. Considerable progress was shown over the records of the preceding year.

With the second annual Indiana state first-aid meet held at Clinton, on Labor Day, Sept. 4, Indiana's first-aid movement took another step forward. As far as actual knowledge of first-aid methods are concerned, Indiana's miners occupy an even plane with those of other mining states of the country.

Remarkable work was done this year, the teams showing striking improvement over their work in former meets. This was particularly noteworthy when it is considered that representatives of the Bureau of Mines allowed but three or four days of training immediately preceding the meet. Judges graded closely every team in each event, yet 21 of the 29 teams in the contest were proficient to the extent of 90 per cent. or higher.

Field team No. 12, team No. 3 of the Clinton Coal Co., won first honors, going through the problems with a percentage of 98. The team had more than one entire point lead on any other team. Capt. Harry Lowe, who headed the team, is a former school teacher and for several years had charge of the science department of the Clinton High School.

By winning first prize this team becomes the possessor of the silver loving cup known as the Reciprocal Indiana State Championship Cup, donated by the Indiana Coal Operators' Reciprocal Organization. It is to remain the property of the team until the date of the next state meet, when it must be contested for again, until one team is successful in winning it two consecutive years. Last year this cup was won by the Oliphant-Wasson team under Capt. Edward Livingston. This team did not defend it this year.

The Bicknell Cup, the special grand prize awarded to the team displaying the greatest proficiency in the improvising

TEAM NO. 3, CLINTON COAL CO., HARRY LOWE, CAPTAIN. FIRST PRIZE WINNER

*Terre Haute, Ind.

TEAM NO. 12 OF CLINTON COAL CO.

ONE OF THE TEAMS IN ACTION

and use of dressings, is to remain the permanent property of its first owners—team No. 1 of the Tecumseh Mining Co., of Bicknell, under Capt. Robert E. Collins. This silver loving cup was won last year by the same team at the Bicknell meet. It was donated by the merchants of Bicknell.

The merchants of Clinton put up the Clinton Cup, to be awarded the team displaying the greatest proficiency in the stretcher drill and to be contested for under the same conditions as the state championship and Bicknell cups. It was won by a team of the Bunsen Coal Co., under Capt. John Krainock. Twenty-five other teams were contestants in this special event, all using the Bureau of Mines official stretcher drill. Military men acted as judges of this portion of the meet.

In addition to the state championship cup, the winning Clinton team received six metal first-aid packets, six medals of the Clinton meet, five medals of the American Red Cross Society and five workers' and one patient's medal of the National Safety Council.

Other teams in the order of their standing were as follows:

Field team No. 10, Miami Coal Co. team No. 1, of Clinton, Capt. Edward Lapworth, 96.8 per cent.; field team No. 19, Vandalia Coal Co. team No. 15, Capt. William Keller Cass, 96.4 per cent.; field team No. 7, Jackson Hill Coal and Coke Co. team No. 1, of Clinton, Capt. T. W. Faulds, 96 per cent.; field team No. 4, Bunsen Coal Co. team No. 1, of Universal, Capt John Krainock, 95.2 per cent.; field team No. 14, Miami Coal Co. team No. 2, of Clinton, Capt. George Waters, 94.8 per cent.; field team No. 18, Bunsen Coal Co. team No. 2, of Universal, Capt. Archie Donald, 94.6 per cent.; field team No. 16, Bunsen Coal Co. team No. 3, of Clinton, Capt. George McNair, 94.4 per cent.; field team No. 9, Knox Coal and Manufacturing Co. team No. 1, of Bicknell, Capt. Andrew Henderson, 94.2 per cent.; field team No. 6, Oliphant-Johnson Coal Co., of Bruceville, Capt. John McArthur, 93.8 per cent.; field team No. 25, Tecumseh Mining Co. team No. 1, of Bicknell, Capt. Robert E. Collins, 93 per cent.; field team No. 22, Miami Coal Co. team No. 5, of Clinton, Capt. Joseph Beno, 92.8 per cent.; field team No. 26, Jackson Hill Coal and Coke Co., of Sullivan, Capt. J. H. Needhammer, 92.6 plus; field team No. 21, American Coal Mining Co., of Bicknell, Capt. R. R. Cook, 92.6 minus; field team No. 11, Ayrshire Coal Co., of Winslow, Capt. George Wickwear, 92.4 per cent.; field team No. 23, Local Union No. 2121 (United Mine Workers of America), of Jasonville, Capt. E. R. Devlin, 92 per cent.; field team No. 2, Clinton Coal Co., of Clinton, Capt. William Burton, 91.8 per cent.; field team No. 15, Knox Coal and Mining Co., of Bicknell, Capt. Thomas Logan, 90.8 per cent.; field team No. 28, Vandalia Coal Co., of Gilmour, Capt. James Brown, 90.4 per cent.; field team No. 8, Green Valley Coal Co., of Jasonville, Capt. Thomas C. Dickenson, 90.2 per cent.; field team No. 17, Princeton Coal Co., of Princeton, Capt. F. D. Thurber, 90 per cent.; field team No. 1, Vandalia Coal Co. team No. 9, of Clinton, Capt. Charles C. Dodge, 89.6 per cent.; field team No. 5, J. K. Dering Coal Co., team No. 5, of Clinton, Capt. John Stevely, 88.4 per cent.; field team No. 13, Vandalia Coal Co. of Latta's Creek, Capt. John P. Dagan, 87.2 per cent.; field team No. 3, Tecumseh Mining Co., of Bicknell, Capt. John Chenye, 85.8 per cent.; field team No. 20, Clinton Coal Co. team No. 3, of Clinton, Capt. Thomas C. Dickenson, 85.6 per cent.; field team No. 27, Miami Coal Co. team No 6, of Clinton, Capt. H. S. Call, 84.6 per cent.; field team No. 24, Miami Coal Co. team No. 4, of Clinton, Capt. John Gray, 81.2 per cent

Field team No. 30 was composed of young girls—all daughters of miners—captained by Mary Stevely. Although dressing no wounds below the hips these girls were recorded for an average of 88 per cent. Their principal competitors were the members of field team No. 24, Miami Coal Co. team No. 4, under John Gray. All members of this team are "trapper boys."

Among the prizes given these teams were American Red Cross Society certificates, Justrite lamps, subscriptions to "Coal Age," first-aid cabinets, Baldwin lamps, first-aid charts and manuals, subscriptions to the United Mine Workers' "Journal," aluminum dinner buckets, tobacco and cigars, clothes brushes, scarfpins, a rocking chair, an alarm clock and a hand axe. The girls received aluminum stew kettles and table lamps, while the boys received pocket knives.

Among the donations for prizes was some cash money. However, it is an unwritten law in Indiana that no cash prizes be given. This is done with the idea of discouraging any professional spirit that it might engender. All money used is for the purchase of first-aid supplies. All of the prizes are practical gifts, while each participant was presented with a metal first-aid packet.

Every member of a team received one of the bronze meet medals. These were unique in design and in accord with original ideas of Dr. August F. Knoefel, of Terre Haute, who is heading the first-aid movement in Indiana. They bear the figure of the Good Samaritan of Biblical days.

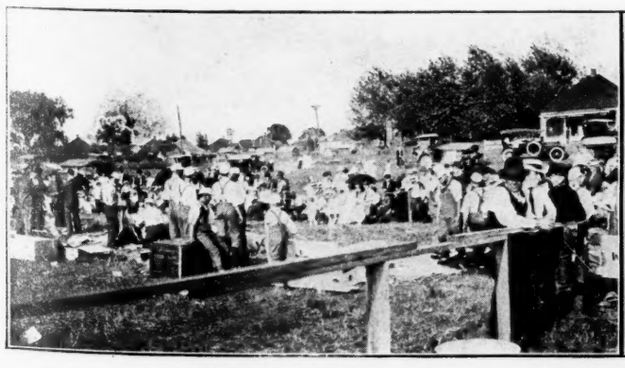
The problems given were as follows:

1. Driver wearing gauntlet gloves jumps off moving car to sprag it; the cuff of one of the gloves catches on corner of car; this causes him to fall under car. He sustains the following injuries: Dislocation of left hip; simple fracture of right arm 4 in. above elbow; in shock; treat.

2. A miner goes into old rooms in search of empty powder cans and because he does not smell gas he is under the impression that there is none present. However, it is present and is ignited by his naked light. He receives burns over his entire body above waist line; this includes head, face, neck, upper extremities chest and back; conscious; in shock; treat.

3. A miner fails to sound roof in his room before starting to work; while loading his car he is caught by a fall of slate and receives the following injuries: Compound fracture of left thigh 3 in. above knee, profuse bleeding; wound on back between shoulders, blood oozing; in shock; treat.

4. A machine runner pulls the machine cable across trolley to feed wires on other side. In doing this the trolley wire is pulled down and falls on outer side of left arm 2 in. above elbow, causing a burn at that point; he is rendered unconscious. Rescue and treat; improvise stretcher and transport patient 80 ft.



A VIEW OF THE FIELD

TEAM NO. 30, COMPOSED OF CLINTON GIRLS

SECOND EXPLOSION WITH BLACK POWDER

5. Miner rides trip between two cars; going around a curve he is caught between corners of cars and sustains following injuries: Wound in left groin, blood oozing; simple fracture of left leg in lower third; bones of right foot fractured; in shock. Treat; transport patient 100 ft., using Bureau of Mines drill.

There was one tie among the teams in solving these problems. This occurred between field teams Nos. 21 and 26, representing the American Coal Mining Co., of Bicknell, Capt. R. R. Cook, and the Jackson Hill Coal and Coke Co., of Sullivan, Capt. J. H. Needhammer. They were given a problem to determine this tie, field team No. 26 winning. The problem was as follows:

A shotfirer lights a shot in his room, then goes into an adjacent room. While there one of the shots breaks through the rib, knocking some props out. He is struck by the coal from the rib, sustaining the following injuries: Wound on outer side of right thigh, practically no bleeding; fracture of right collar bone; in shock. Treat.

At a given signal a dozen or more boy scouts came out of a tent occupied by Dr. August F. Knoefel at the edge of the field, and ran to the judges, for whom they were acting as pages. Each carried the next problem. Another copy was handed to P. A. Krogsdahl of the Bureau of Mines, who read it through a megaphone for the benefit of the audience. The doctors who acted as judges gave copies to the teams, and a signal gave all permission to go to work.

To the west of the field a short distance was the plot laid off for the coal-dust-explosion demonstration, carried on under the direction of Foreman Miner G. T. Powell, of the Bureau of Mines. The long entryway was a continual source of curiosity to the unitiated, and "Bertha," the home-made cannon constructed last year under Doctor Knoefel's direction, was covered with heavy logs to keep her from "bucking" and giving the teams some actual experience.

As each team finished a problem the reports of the judges were carried by the pages to the recorder's tent, where D. J. Parker, mining engineer, of Pittsburgh, and H. I. Smith, division engineer, or Urbana, Ill., both of the Bureau of Mines, were kept busy. The Indiana system of recording was carried out to perfection by Doctor Knoefel, according to his own ideas. This method is simple and practically eliminates any chance for error, being so arranged that within 5 min. after the last score card has been turned in it is possible to ascertain if any ties exist.

Particular attention was called to some of the rules, and the judges were instructed to insist on their enforcement. These were rules 7, 8, 9, 10, 11 and 27, and were as follows:

7. Preceding all events it shall be the duty of the captain of each team to see that all triangular bandages are unfolded, as no folded triangles will be permitted, except those that are folded during the event for which they are to be used.

8. All splints and padding for the same must be prepared during the event for which they are to be used.

9. The triangular bandage shall be the standard used in the contest.

10. All open wounds must be covered with the bandage compress of proper size. The standard bandage compresses are as follows: Small bandage compress, used as finger dressing; medium bandage compress, used in dressing small wounds; large bandage compress, used in dressing large wounds.

11. In dressing all burns in contest work, it is suggested that plain sterile gauze be used, to prevent staining the skin which follows use of picric-acid gauze.

27. The judges have been instructed to discount a team 18 points for applying a dressing to the wrong limb or the wrong side of the body. The eighteen points are made up as follows: Lack of attention, 2; not locating injury, 4; improper treatment, 12.

Three good explosion demonstrations were given, showing the safety of permissible explosives and the danger of black powder resulting from blownout shots in dusty mines. A long chamber had been constructed for these tests and on the final explosion, the second with black powder, a large portion of it was destroyed by the force of the blast.

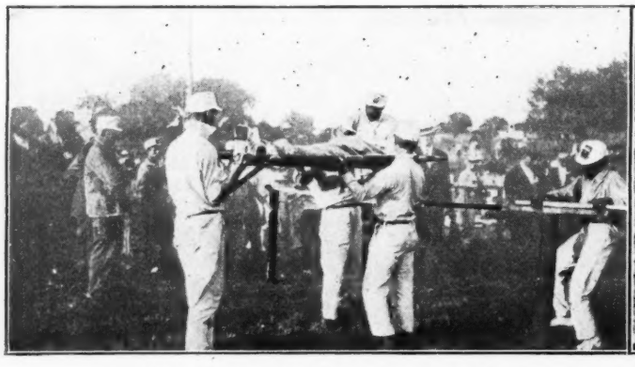
The increased use of permissible explosives throughout the country has been a great step toward increased safety. However, Indiana is backward in this respect. It is believed that within the next two years a majority of the coal producers will make the change. Indiana is one of the few states where the use of "permissibles" is not general, and Indiana coaldust is inflammable.

All teams participating in the meet had plenty of material and none were forced to send to the city for any forgotten supplies. Three weeks preceding the affair Doctor Knoefel sent to each team an adequate list of suggested material for contest work.

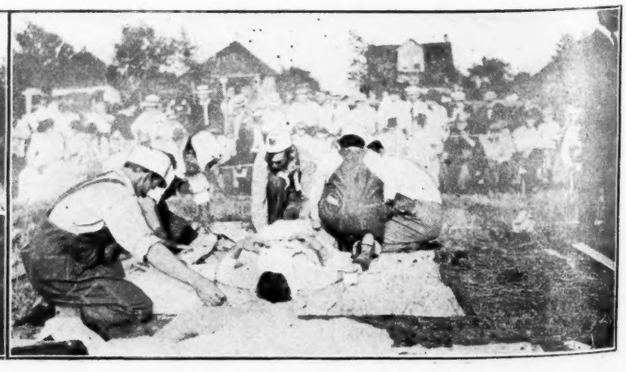
The sun was sinking below the Western horizon when the tie between field teams Nos. 21 and 26 was worked off, and all teams were packing up their materials. The banquet in the basement of the Christian Church marked the final event of a successful day. More than 300 people were seated at the tables.

Doctor Knoefel was the first speaker introduced. He spoke comforting words to those who did not win first place and congratulated the leading prize winners, but declared that the greatest prize any man could receive was the knowledge and assurance that he could help an injured fellow-worker.

Before the teams voted on the city at which to hold the meet next year, the state song, "On the Banks of the Wabash," was sung by a male quartet, all present joining in the chorus. Linton and Jasonville were the contesting cities, the latter being selected. Prizes were then distributed, and each winner was asked to make a short talk. Some responded while others did not. Suspense was maintained through the fact that the list was read backward—the winner of the first prize and the cups being held until the last.



TEAM NO. 11 IN STRETCHER DRILL



ANOTHER TEAM IN ACTION

Susquehanna's Seventh Meet

SYNOPSIS—On Sept. 23 the Susquehanna and Lytle coal companies held their seventh annual meet with forty-six teams, six of which were of breaker boys. One of these boys' teams carried off the honors in the one-man event. The company dispensed with the elimination contest.

The Susquehanna Coal Co. and the Lytle Coal Co. held their seventh annual intercompany contest at Edgewood Park, Shamokin, Penn., on Sept. 23, 1916, and it proved by its success that the interest in first-aid work is growing year by year. There were 46 teams in the competition, containing 287 members including captains and patients.

When first-aid work first started in the anthracite region there was some discussion as to the payment of men for taking part in first-aid practice. The men felt it was a humanitarian work and should not be compensated, while the operators were quite willing to pay those who worked at it out of the regular working hours. A compromise was effected by which the teams practiced in company time at the expense of the company and attended the lectures in their own time.

This arrangement worked quite satisfactorily, and the interest in first-aid has consequently grown steadily. As large numbers of contestants and guests attend these meets, special trains are run by the two coal companies. One train comes from Minersville over the Philadelphia & Reading Ry., another from Williamstown over the Pennsylvania R.R., and a third from Wilkes-Barre over the same road. By making an early start they manage to arrive in Shamokin by 9:30 a.m., after which it is only a short trolley ride to Edgewood Park.

The practice at the Susquehanna meet is to have all the teams work at the same time and to have three judges who examine all the patients. The actual bandaging takes about 5 min., but the judging of any event takes half an hour. The three judges were Dr. J. B. Rogers, of Pottsville, Dr. D. H. Lake, of Kingston, and Dr. J. W. Geist, of Wilkes-Barre.

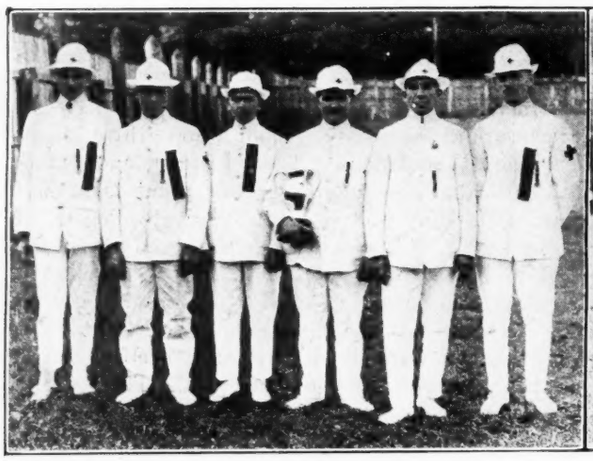
There were six teams of breaker boys in the contest and one of these—that of the boys from the Pennsylvania colliery at Mount Carmel—distinguished itself by carrying off the prize for the one-man event. The team of men from the same colliery had to take second place, but it succeeded in obtaining a score only inferior to that made by these clever breaker boys and in beating all the rest of the field.

The outside team of the William Penn colliery took first prize in the two-man event with the outside team of the Scott colliery a close second. These men, as also the winners in the one-man event, were each recipients of the Susquehanna Coal Co.'s handsome French bronze medals.

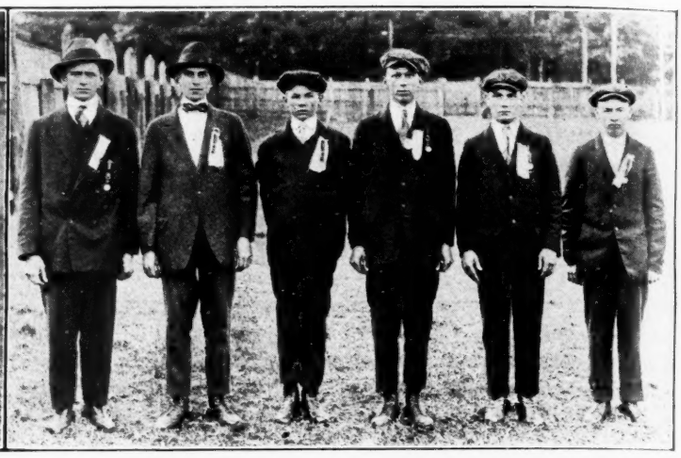
AS ALL 46 TEAMS WORK AT ONE TIME THE SCENE FROM THE GRANDSTAND IS QUITE ANIMATED

The three-man event fell to the Hickory Ridge colliery team of Shamokin, the No. 2 slope team from No. 5 colliery taking second place. After this event was decided adjournment was taken for lunch, which was served in the grove adjacent. A thunder shower followed the repast and rendered the ground unsuited for any further contest. The full-team event was therefore held in the Pavilion, and victory fell to the outside team of Richards colliery, Mount Carmel, with Dennis Burke, captain; Jake Hollister, George Becker, Owen Rodgers, Jess Singley and Charles Trewella, members. The team from No. 2 shaft of No. 5 colliery, Nanticoke, took second place.

The Glen Lyon breaker boys took the leading place away from the boys of the Pennsylvania colliery who



OUTSIDE TEAM, RICHARDS MINE, MOUNT CARMEL
Who were the winners of the full-team event



VICTORIOUS BREAKER-BOY TEAM FROM GLEN LYON
To whom the "Pennsyl breakies" had to make way

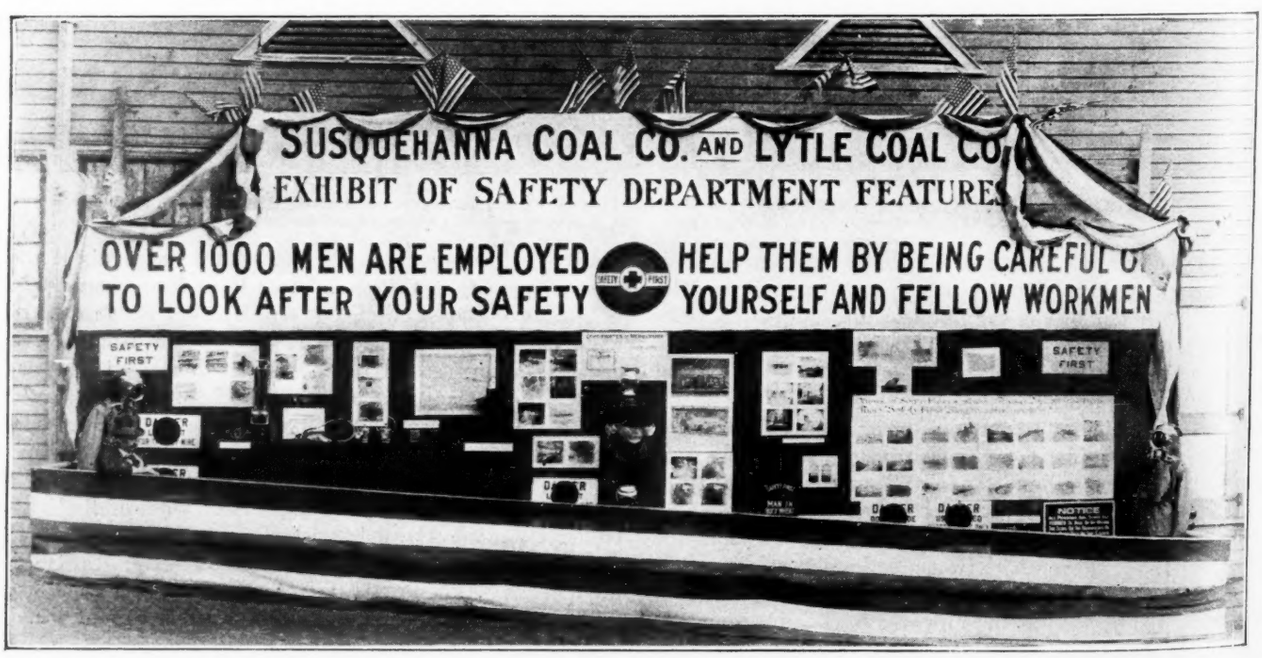
won it the year before. However, these latter boys feel more than compensated by the fact that they beat the whole field in the one-man event. The roster of the Glen Lyon breaker boys is as follows: Otto Sutter, captain; Louis Wright, Stanley Doliba, Stanley Vinchkoski, Russel Evans and Charles Wright. This year the company dispensed with the elimination contest and the absence of it was so favorably commented on that it seems likely that it will not be revived in the future.

After a march past the grandstand, Robert J. Quin, the general manager, Morris Williams, the president of the Susquehanna Coal Co., and W. J. Richards, the president of the Philadelphia & Reading Coal and Iron Co., addressed the assemblage. The "Susquehanna" and "Reading" are reciprocating honors and favors. It will be recalled that Morris Williams attended the Reading meet at Lakeside Park on the Saturday preceding, and it is to be noted that the Susquehanna sent its winning teams in the cup contest of last year to the Reading contest of this year and, it may be added, the winners at the Reading contest were present at the meet just described.

At the entrance to the Edgewood Park grandstand the Susquehanna and Lytle coal companies made a display of the improvements installed at their mines during the past year and of plans proposed and to be adopted for the prevention of accidents. Among others was a device for notifying loaders that a man was in the coal bin and the load should not be discharged. The company employs from 12,000 to 13,000 men, and of these about 1,000 men are principally engaged in the protection of their fellows from the dangers of mining.

The company, having given such evidence of its willingness to expend money and effort in promoting safety, appeals strongly to its men on its exhibit board, asking them to do their part in avoiding accidents; and every symptom indicates that they will not be slow in answering that appeal satisfactorily.

A feature in the Susquehanna meet is its excellent musical accompaniment. While the first-aid teams were busy bandaging imaginary injuries, the Shenandoah and Shamokin bands on the grandstand alternately played classical music, varying their work with vocal selections.


SUSQUEHANNA COAL CO. AND LYTLE COAL CO.
EXHIBIT OF SAFETY DEPARTMENT FEATURES
OVER 1000 MEN ARE EMPLOYED TO LOOK AFTER YOUR SAFETY
HELP THEM BY BEING CAREFUL O YOURSELF AND FELLOW WORKMEN
SAFETY FIRST
SAFETY FIRST
NOTICE

THIS SAFETY EXHIBIT IS PECULIAR TO THE SUSQUEHANNA MEET AND IT PERFORMS VALUABLE WORK

Editorials

Eyesight Dangers in Mining

We have a way of emphasizing the specific and the principal dangers of an industry to the exclusion of other dangers which are neither principal nor specific. Falls of ground are almost exclusively hazards of mining and the main part of the miner's risk is from this single cause. Moreover, the injuries so suffered are quite frequently fatal. Consequently, most of our energy is expended in meeting these dangers.

C. W. Goodale, at a session of the American Institute of Mining Engineers at Bisbee, Ariz., recently declared that it was easier to reduce loss of life in mining than in smelting, because the minds of the workers could be easily trained to precaution against a single well-recognized danger, whereas it was hard to line them up against the multifarious and often unrecognized dangers to which men in smelteries are exposed.

What is true of the miner is equally true of the operator. He has falls of roof on his mind all the time, and this is doubtless fortunate. But he must not forget those men who are not so exposed and who yet need his care and protection. Though mining is not a manufacturing business, the operator has many men working for him who are engaged in the work of fabrication—men who are making, grinding and repairing tools. For the protection of their eyes such employees need goggles just as much as the men in a machine shop.

No one can be sure how far the wearing of goggles may go. In years past only men of leisure wore gloves. It was considered an effeminate folly, and some of us can well remember being "jolted" by miners when we wore gloves underground. But times have changed. Now, most mine men use gloves, for the most part cheap canvas substitutes of the daintier gloves of early time; but they keep the hands free from cuts and protect them from some of the bruises they would otherwise sustain, and such care for their condition gives the miner's hands a better appearance on the street and in the home.

Goggles are being worn quite generally by automobilists to protect their eyes from dust and from the blinding effects of wind on bare eyes. It may not be many years before miners, who need them much more than do automobilists, will adopt them also. They cannot discommode or disfigure them any more than they do the man or woman speeding along in a motor car.

Of course the miner who does not need glasses to correct the refractive errors of his eyes will not wear goggles on going below ground in cold weather because the moisture in the mine will becloud them until the glasses rise to the mine temperature. But he may well use them while at his duty, and he will find doubtless no little comfort from the practice.

For the present the goggle will find its principal use where the dust from tipples blows in a heavy cloud, in the grinding and repairing of tools, and in working before the coke ovens. That their use will extend rapidly is our prediction, especially when men learn that the ability to endure discomforts and confront dangers is not so important as the ability to avoid them. In earlier days many people suffered from pneumonia and died from it because they prided themselves that they were superior to umbrellas, raincoats and overshoes.

The H. C. Frick Coke Co. has for a long time supplied goggles to the men in its mine-car repair shops. The company is now engaging the services of an optometrist so that the goggle glasses may be fitted to the ocular needs of the men to the end that the use of the goggles may not reduce the efficiency of the employees or expose them to dangers arising from imperfect vision.

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Pocket Manual on Rescue Work

The United States Bureau of Mines has just published a booklet entitled "Rescue and Recovery Operations in Mines After Fires and Explosions," James W. Paul and H. M. Wolflin being the authors. The former discusses coal-mining and the latter metal-mining conditions. The meaty material contained in the booklet is rendered even more valuable by its being bound in a form that enables it to be conveniently carried in the pocket. For those who will doubtless come to need it more and more as a reference book the Superintendent of Documents has provided a red buckram binding instead of its ordinary paper covers.

It confronts from the beginning the deceptive proverb that "an ounce of prevention is worth a pound of cure" by stating that "so many explosions have occurred in well-equipped mines that preparation for emergencies should be made at all mines, especially at those where all the known accident-preventive methods are not in use." No mine can be so well safeguarded that proper preparation for accident can be overlooked or ignored, and officials are rightly instructed to ascertain "where material and tools" for rescue work "may be quickly obtained at the mine or supply stations or from adjoining mines and from the nearest jobbers, saw mills, planing mills and wholesale houses."

There are many officials in mines that are worked by open lights who would not know where to go to obtain safety lamps with which to equip their rescue crews. They have given the matter no consideration, as if their mines were absolutely safe and they could never experience an explosion or a mine fire. The problem of preparedness has never been studied. To consider it would be regarded as conjuring up an unpleasant vision or expending time and money on an unlikely contingency. So when the event which has been but little anticipated occurs, there is no recognized mode of meeting the difficulty, and delays result for which later planning can never atone.

In this work of preparedness the placing of this book and others such as Garforth's in places where they may readily be found is to be recommended. If the men in charge are too much harassed and worried to read it in such a time of stress, someone may be found to check up

its counsels and provide in due order the material and assistance which is so essential to the work of rescue.

The book emphasizes the need that many rescue men be available around the mines. The trained crew of a Bureau of Mines car is quite inadequate for rescue work and should be supplemented by local men with apparatus. The booklet recommends that there should be in each case of recovery, 5 crews, each of 5 men, and at least 15 sets of apparatus, for rescue work cannot be conducted by tired crews. It is hard work, and to perform it successfully the men must labor in shifts for four hours only, being two hours at actual work and acting for two hours as a reserve.

This little volume may, of course, contain some matters of a debatable character, but if it meets with the approval of the inspectorate in any state, it might well be honored as a text-book and used as the basis for examination of mine foremen and others. Its introduction as a textbook in mining schools and institutes is to be anticipated with confidence. It arouses much thought on matters which are of the utmost importance and to which too little attention has hitherto been given.

Maps and Charts That Deceive

Where all the facts are not known, nothing is more deceptive than a map; for what is omitted on it is believed to be nonexistent, and whatever is outlined even with broken lines is considered as the outcome of a careful survey. It seems sometimes impossible to tell "the truth, the whole truth and nothing but the truth" in a map or sketch.

Let us suppose a piece of coal has been taken out and a surveyor is called in. He succeeds perhaps only after much difficulty in locating two or three places at which he is able to enter the edge of the old workings. He cannot survey between the points because of fallen rock. On his map he draws a dotted line between the points ascertained, representing what he has good reason to believe will delimit the working place which cut both of them off, judging by the orientation of the rib of the place at all points, where he has been fortunate enough to penetrate the working.

He takes his map into court and swears that this dotted line represents the line as he surmises it would be found could it be located by a painstaking survey, while he declares that the solid lines exhibit areas properly surveyed. The jury and even the opposing counsel accept the dotted line as final. They seem hypnotized by it.

The draftsman who made a broken line, who swore it was merely the best guess possible under the circumstances, can hardly undo the spell cast by his work. If, however, he had failed to draw the line and left it undetermined and unindicated, what a time he would have had to convince the jury that a working place did almost certainly connect in some way the several points located.

Years ago, the maps of the world showed the South Pole a white void surrounded by blue sea, and the public needed no Shackleton to tell them that there was a continent where that white void appeared. There was no way of expressing the unknown, and the clumsy attempts of the geographers could but convey to the mind of the layman the idea that a mammoth and symmetrical continent lay in that silent and mysterious unexplored region.

The map to the lay mind is an instrument of perfect expression. It admits of no "ifs and ands." The dotted line is not a sufficient symbol of uncertainty; the uncolored area is not the infallible sign of the unexplored, for both these signs have other uses. The dotted line, for instance, may show merely another kind of thing—a road perchance, a surface building, the definitely located outline of an edifice removed or yet to be built, or let us say, a water course which frequently runs dry. There is no universal symbol of doubt, and when one looks at a map one is seemingly convinced that, while untruth may be found in the presentation, certain it is that no attempt is being made to express doubt or probability.

How unfortunately do our geologists deceive us—and indeed themselves—with their stratigraphic charts. View for instance a couple of cross-sections from the Pennsylvania Topographic and Geological Commission's Reports, 1906-1908, reproduced as a plate in Ries' authoritative "Economic Geology," just appearing in its fourth edition. In this cut the various formations—Chemung, Portage and Hamilton—are represented as if approximately parallel to the surface measures and as almost of unchanging thickness.

In short, they appear as they might if drawn with a road pen somewhat well distended, and the lines are solid as if no doubt whatever existed in the mind of the geologist about the thickness and conformability of the measures. The smirk stiffness of the lines silently gives the lie to the story of unequal tectonic movement, unequal stress, the crumpling of weak beds, the inequality of deposition and the tectonic movements which preceded the deposition of later beds and caused synclines and anticlines of a different order to those we now so industriously chart. Yet these earlier foldings have doubtless a considerable effect on the location of oil and gas as we should doubtless find could we but trace them.

But those solid lines, those graceful curves, those continuous waves from crop to crop, they lull us sensuously to sleep. Who would think in following them that there were variations almost as marvelous and yet as certainly to be anticipated as those exhibited by N. H. Darton in his address to the New York section of the American Institute of Mining Engineers, one of which illustrations of the variation in tectonic movement appears in his bulletin on the "Occurrence of Explosive Gases in Coal Mines."

Unfortunately, these lines which mask the cataclysms by which the earth reached its present form give us such confidence we ask nothing further; but while there is a doubt is it too much to ask that some one have pity on us and give us some cross-sections, which, while they will cover equally large areas, will at the same time be more nearly correct? Or, meanwhile, will not the geologists gives us at least a warning when publishing such charts so that when poring over their books we may not go too widely astray?

Government Attorneys Open Winter Campaign

One can always be sure that summer is actually past and legal vacations over when the news goes forth that in some governmental tribunal the Attorney General's office at Washington is praying to have the various anthracite producing and carrying companies enjoined to

conduct their business in some new manner. Memory fails to serve exactly when this began, but we do know that always in the interim the people continued to need coal and the mining companies have done their best to meet that need. In the meantime, though, the wonderful law of succession has never failed to change the personnel of the administrative department of our Government, and with legal and political reputations to be established and maintained, we sometimes are wont to wonder if the anthracite case is not made to serve this purpose, particularly because of its spectacular appeal to the general public. Surely the celebrated case of Jarndyce vs. Jarndyce has nothing in comparison with Government vs. Anthracite. Could it be, too, that the present activity in this direction may have something to do with the impending presidental election, for the intimation is broached that we are to have a decision before the first of November. One never can tell.

Recent Legal Decisions

Injury to Outsider on Mining Property—One injured while walking along a roadway near a coal tipple, through being struck by a timber thrown or falling from the tipple, is not to be regarded as a trespasser if the roadway was used generally by the public. (Alabama Supreme Court, Barney Coal Co. vs. Hyche, 72 Southern Reporter, 433.)

Invalid Promise to Pay Third Person's Debt—Plaintiff coal company, having sold and delivered fuel to a third person on whose sole credit the sale was made, is not entitled to collect the amount from defendant, who succeeded to such third person's business, on a mere verbal promise to pay the plaintiff's claim. A promise to pay another person's matured debt is not enforceable unless reduced to writing. (Kansas Supreme Court, Atlas Coal Co. vs. Tomkins, 158 Pacific Reporter, 1,106.)

Computation of Corporate Taxes Against Mining Companies—In assessing taxes against the income of a mining corporation under the Federal Corporation Excise Tax Law, the company is entitled to a deduction from the full value of coal mined to cover depreciation in the value of the mining property through removal of such coal. (United States District Court, Middle District of Pennsylvania; Forty Fort Coal Co. vs. Kirkendall; 233 Federal Reporter, 704.)

Demurrage Under Vessel Charters—Where a charter of a vessel, to carry coal for as many voyages as could be made in coastwise trade until the substitution of another vessel, contained provisions for demurrage and exempted the owner from liability for dangers of the seas and risks of navigation, loss of the vessel by storm before such substitution did not prevent the owner from recovering demurrage which accrued previously. (Massachusetts Supreme Judicial Court, Coastwise Transportation Co. vs. New England Coal and Coke Co., 112 Northeastern Reporter, 638.)

Negligence Essential to Liability for Injury—Before an operator's violation of a provision of the Pennsylvania Anthracite Act can render him liable for injury to a miner, it must appear that the violation was the direct cause of the injury. There can be no recovery for injury resulting from the fall of part of a mine roof, in the absence of proof as to the cause of the fall, when it appears that the place had been tested with reasonable diligence and was regarded as safe. (Pennsylvania Supreme Court, Rekiec vs. Delaware & Hudson Co., 97 Atlantic Reporter, 576.)

Effect of Indiana Employers' Liability Law—The Indiana statute, which declares that the fact that inherent or apparent danger or hazard has contributed to an employee's injury shall be no defense to the employer's liability, does not dispense with negligence as an essential element of liability, and an employer may still evade liability unless it be shown that he knew, or was fairly chargeable with knowledge, of the existence of the particular danger which resulted in an employee's injury. (Indiana Appellate Court, S. W. Little Coal Co. vs. O'Brien, 113 Northeastern Reporter, 465.)

Statutory Duty of Mine Foreman; Scope of Miner's Employment—The Pennsylvania Bituminous Coal Act of May 17, 1893, does not make instruction of inexperienced miners a part of the statutory duties of a certified mine foreman; this responsibility remains with the employing operator. Nor can a coal company defeat liability for injury to a miner while assisting a co-employee at the latter's request, under circumstances indicating that the co-employee was authorized to require the assistance, on the ground that the injured man acted beyond the scope of his employment, where he was not specifically instructed as to his duties. (Pennsylvania Supreme Court, Smiers vs. Ford Collieries Co., 97 Atlantic Reporter, 577.)

Care Required Toward Mere Licensees on Premises—In dismissing suit brought against a coal-mining company on account of the death of a temporarily laid-off employee who was killed through an explosion of powder while on the company's premises to assist another employee in procuring tools, it is held that the case comes within the general rule of law that an owner of premises is not responsible for injury to a mere licensee unless resulting from willfulness or malice. There is, however, a duty to warn such persons against imminent dangers to which they are exposed with the knowledge of the owner of the premises or his representatives. (Tennessee Supreme Court, Willoughby vs. Westborne Coal Co., 180 Southwestern Reporter, 322.)

Kansas Workmen's Compensation Act Applied—A Kansas miner is entitled to compensation under the Workmen's Compensation Law of his state for injury sustained under the following described circumstances: At the end of a day's work, he changed his clothes, and still carrying a miner's lamp, started toward the bottom of the shaft with the intention of ascending to the top of the mine. About 200 ft. from the room where he had been at work and about one-half mile from the bottom of the shaft, his face came in contact with a piece of slate, which was hanging from the roof of the mine, and the sight of one of his eyes was thereby destroyed. (Kansas Supreme Court, Sedlock vs. Carr Coal Mining and Manufacturing Co., 159 Pacific Reporter, 9.)

Routing of Shipments—A railway company which operated a direct intrastate line between two points on which the rate on coal was $1.28 was not entitled to make delivery over another, but a longer and interstate line between the same points, and to recover the higher rate of $2 applicable to that line, there being no good reason for the routing at the higher rate. Where a contract for the transportation of freight gives the carrier an option between routes, the option must be exercised with regard for the interest of the shipper. To justify the carrier in using the more expensive route, it must be at the shipper's or the consignee's request, or because of some reasonable necessity for routing under the higher rate. (Minnesota Supreme Court, Solum vs. Northern Pacific Railway Co., 157 Northwestern Reporter, 966.)

Injury to Trespassers; Excessiveness of Verdict—A coal-mining company's employee's minor son was injured while gathering coal for his family's use about the company's tipple, the accident resulting from a car breaking away on an incline. There was no negligence toward the boy after his peril was, or could reasonably have been, discovered, although the company may have been chargeable with neglect to keep the appliances of the car in reasonably safe condition—a matter of which a mere trespasser is not legally entitled to complain. Held, that unless the company had agreed to permit employees to gather coal under such circumstances for their own personal use, or had acquiesced in their custom of doing so, the injured boy was a trespasser and damages cannot be recovered on account of the accident. In any event, $7,000 is excessive recovery for the injury, consisting of fracture of the skull which will not cause any permanent disability. (Kentucky Court of Appeals, Dozier vs. Carter Coal Co., 186 Southwestern Reporter, 140.)

Pennsylvania Mine Foreman Law; Supplying Props; Safety of Roof—The circumstance that a Pennsylvania certified mine foreman may be entrusted with duties pertaining to measuring of coal, dealing out supplies, etc., makes him no less a state officer, so far as concerns the operator's liability for injury to an employee resulting from breach of the foreman's statutory duties. A Pennsylvania mine owner is not responsible for injury resulting from negligence of the foreman or his assistant in failing to make their daily inspection, or in conducting it so carelessly that dangerous conditions were not detected, in the absence of proof that such owner knew that the foreman or his assistant was not properly discharging his statutory duty. Nor may an operator be held to have failed to supply props, as required by the Pennsylvania law, merely because they were not piled in the galleries, where they would have obstructed operations; it appearing that sufficient props were always available elsewhere as needed and ready for the foreman's direction for their use. That a mine gallery roof had stood for two years before a miner was injured by falling rock precludes a finding that the mine owner was negligent in the original construction of the gallery. (United States Circuit Court of Appeals, Second Circuit; Lehigh Valley Coal Co. vs. Washko; 213 Federal Reporter, 42.)

Discussion by Readers

Improving the Coal Industry

Letter No. 1—W. H. Noone might now fully explain his proposed method of improving the coal industry by the bonus system mentioned in his prize letter that appeared in *Coal Age*, Sept. 23, p. 507. Perhaps, he means to give bonuses to all employees, from the president down, which in short would raise the wages all around. By so doing, does he expect that the production per man will be increased and the cost per ton lowered?

The chief desire of all operators at the present day and in the past has been to lower the cost of production, and they frequently succeed in doing this, when increased wages, shorter hours and higher cost of materials are all taken into consideration. But the margin between the cost of production and the selling price does not increase, and it would be interesting to know how Mr. Noone proposes to increase this margin by giving bonuses to employees; and, further, if the giving of bonuses will not increase this margin how will the industry be improved?

When a number of operators, in any locality, succeed in lowering the cost per ton, and the production is slightly over the demand, they begin to offer coal at a reduced price. Will Mr. Noone say how his bonus scheme will prevent this? Also, they ship coal that has not been sold and offer it at a price below the cost of production—a suicidal policy. How will the giving of bonuses stop that?

This question should not be allowed to rest until it has been threshed out to a finish if the industry has to be improved. Therefore, I want to ask Mr. Noone to explain how his bonus system will remove ten sales-agents whose work can be done by one? SAMUEL DEAN.

Delagua, Colo.

Letter No. 2—In reading the various letters offering suggestions in regard to improving the coal industry, which appeared in *Coal Age*, Sept. 23, pp. 505-507, I notice one statement in the letter of C. S. Schwartz, Blairsville, Penn., that touched a sensitive chord.

Mr. Schwartz says, "Decline to recognize or deal with the union, until the strike clause has been eliminated from their by-laws or regulations." I have been wondering how the following of this suggestion, by coal operators generally, would better conditions in the mine and improve the coal-mining industry. I want to ask Mr. Schwartz to glance back to the days of nonunionism in 1894, when coal was being mined at a rate that did not afford a living wage. At that time miners were paid 35c. a ton and had to go to work before daylight and come home after dark, in order to maintain their families. There was little in a miner's life but slavery.

Compare conditions then with those at the present time. Although miners are now getting little more than a living wage, they reach home by 4 p.m., which gives them two hours of sunshine to recuperate their bodies and fit themselves for another day in the mine. This respite from toil also acts as an education that enables a miner to perform his work more intelligently than he did 20 years ago. In nonunion days, a mine foreman was obliged to work for a salary of $75 a month, while now he is able to render a better service and, for this increased efficiency, he receives $100 a month for which he has unionism to thank.

I agree with Mr. Schwartz in everything, except in the stand he takes against the miners' union. I was once a union miner myself; and while I do not believe in strikes, as I think there are other ways of settling differences between the men and their employers, I feel that when the miners' organization is properly controlled there is a great benefit to the men from this source. I think that unionism should be recognized and that such recognition would go far toward establishing good relations between employer and employee. EX-MINER.

Madera, Penn.

Safety in Wise Policy in Mining

Letter No. 1—One of the causes of friction between miners and operators is an unwise insistence, by either party, upon its supposed rights in regard to a trivial matter. The rights claimed may be poorly defined, or not defined at all, in the contract between the parties.

It is often amusing to think how much importance is attached to little matters that could have been adjusted amicably if approached in a fair-minded manner. Friction arising from this or any other source is an element that indirectly impairs the safety of mining operations and should always be avoided by a wise manager, whose policy should be to avoid such chances of friction with his employees.

It was seemingly an unwise thing for the Delaware, Lackawanna & Western Railroad Co., Coal Department, and its employees, at the Taylor colliery, to allow the question of payment for coal loaded without checks to be referred to the Conciliation Board, as reported in *Coal Age*, Sept. 16, p. 463. The matter in dispute was of little importance. According to the report, the miners wanted the money for these lost cars divided equally between them, while the company claimed that it might be called upon to pay for those cars should a miner succeed in substantiating his claim to having loaded them. If credited to the miners, the company would be paying twice for the same coal.

In my opinion this was too small a grievance to be brought to the attention of the Conciliation Board, and an amicable adjustment would have reflected credit on both the company and the men in its employ. I presume that conditions at the Taylor colliery are quite similar to those in the Hocking Valley district in Ohio, in respect to the manner of treating lost coal. Cars loaded without checks are infrequent in this district; but when that happens, as it will occasionally, it is customary to carry the weight of such cars on a separate memorandum, until the coal is claimed and can be credited to the right party

on the weighsheet, or until ample time has been given for claims to be made.

At many mines all lost cars loaded before the 20th of the month are at the end of the month placed to the credit of the Miners' Burial Fund. Men are thus given from 10 to 30 days in which to present and substantiate their claims for any lost cars. After such cars are once put on the weighsheet no claim is allowed. Where company coal is loaded, the company may receive a proportional share of the lost coal. I am not aware of any complaints ever having been made by either operators or men against this system of crediting lost coal.

New Straitsville, Ohio. GEORGE N. LANTZ.

Letter No. 2—A matter that should receive more consideration than it does, in respect to its relation to safety in mines, is the question of policy in mine management.

The policy of a coal company, as manifested in the treatment of its men, goes far toward establishing and maintaining safe conditions in the mines. A good policy on the part of the management develops a spirit of coöperation among the employees, and various minor details are given attention by men who would not perform the same service or use the same care and caution under a more austere management. Men are human, and must be treated as human in order to obtain the best results from the services they render.

By way of illustration, I want to refer, briefly, to two assumed companies operating coal mines under like conditions, but with widely varying policies in respect to management. This difference in policy is manifested in every branch of the work, and the effect is plainly seen in the daily operation of the two mines and the conditions prevailing therein.

A Broad-Minded Management

The management of Company No. 1 has adopted a broad policy regarding the relation of employees to its various interests. For the convenience of its men, this company operates a commissary in the same manner as a large department store would be operated by an independent and wholly separate concern. In the same way the company furnishes comfortable and well-kept houses, which it rents for a reasonable amount to such of its employees who desire to live in them.

In the operation of the mine the company expects every employee to give an honest day's work for a day's wage. The man who is able and willing to render good service is employed and paid for the service he gives, according to its value. If the man desires to live in a company house he can do so, or he is free to choose other quarters, and his services are not discounted by reason of his so doing. The man can either trade at the company store or go elsewhere for his goods, without embarrassing his relation to the company or being in fear of losing his place in its employ.

The commissary is run on an equitable basis, and a fair profit is charged for the goods sold, the prices varying with the market. No effort is made to overcharge a man for goods or to favor one having a large family, for the purpose of holding his trade; but all men are treated alike.

The effect of such a policy on the part of a management is to elevate the men to a true standard of living. Each man is made to feel that he is a true American citizen, and the result is that he performs his work with an honest purpose. He stands higher in his own estimation because his mode of living is not dictated by another. He is animated by a spirit of coöperation, feeling that he is a factor in the work. The average man, under these conditions, will be encouraged to render the company his best service. The ultimate result of this wise policy is to establish closer relations between the men and the company. Every man feels that efficiency and work stand first, and that store accounts and house rents are only matters of convenience in the way of providing a comfortable living for all employees.

A Selfish, Narrow-Minded Policy

Now, contrast this policy and the resulting conditions with the policy and conditions that exist in Company No. 2, whose first consideration is the willingness of the worker to allow the company to absorb practically his entire earnings in return for house rent and store accounts.

In the employment of its men preference is given by this company to those applicants who have large families and are willing to occupy company houses and trade at the company store. If an applicant for work signifies that he is willing to do this, he is given every advantage in the mine. As has been stated in *Coal Age*, there is a class of miners that will take advantage of this feature in mine management, by letting his store account grow, hoping thereby to be given one of the best places in the mine. Often the mine foreman is instructed to favor such a one in order to help square his account at the store.

The result of this unwise policy is to develop a dependent and generally worthless class of mine workers, who grow to be parasites on the company's hands. The honest worker is economical in his manner of living, and a good miner, who is naturally discouraged where such conditions prevail, will eventually seek another place where his work receives recognition and due reward. A good workman always desires to earn the wages he receives and will claim the privilege of spending his money according to his own inclinations and in a manner that will provide the greatest comfort for himself and family.

Having contrasted these two policies, I want to ask, in closing, which of them will develop the greater degree of safety in the operation of a mine? In which of these two classes of mines will human life be held in the higher estimation, and in which camp will the lives of the mine worker and his family be made more worth while? Finally, which of these two policies will eventually provide the greater returns to the company?

Briceville, Tenn. CLOSE OBSERVER.

Safety and Efficiency in Mining

Letter No. 1—It was with some curiosity and keen disappointment that I read the article of Edward H. Coxe, *Coal Age*, July 29, p. 176, hoping to find something novel and of interest, coming as it does from one in a position to acquire a broad practical training in addition to his technical knowledge.

Practical men who have attained to a moderate degree of efficiency, through a schooling of hard knocks, are inclined to regard with deference the statement of one of higher attainments. To such, Mr. Coxe's article must appear superficial, being a summary of what has often been repeated and lacking, as it does, any originality in its author in respect to mining problems.

In his remarks on discipline the author seems to have confounded this moral attribute with obedience. It is possible to enforce obedience to a set of rules and regulations, but discipline in mining is a condition growing out of such enforced obedience. The highest discipline is realized when men are taught to conform to rules because the rules are right.

Again, under the heading, "Do it Now," Mr. Coxe quotes two old adages: "A stitch in time saves nine," and "An ounce of prevention is worth a pound of cure." To practical, hard-working mine foremen and their assistants, these maxims seem superfluous. Their observance constitutes the primer of economical coal mining. Mr. Coxe should know that when work underground does not conform to this principle it is the fault of the men higher up, who have failed to make suitable provision and supply the necessary material to enable the mine foreman and his assistants to perform the work required for the efficient operation of the mine.

Retrenchment underground and curtailment of necessary expenses of operation are false economy—errors of management, both in respect to the cost of production and mine safety. Mine management is too frequently a long-distance proposition. Too often operating expenses are made to conform to market prices as regulated by supply and demand. A more practical remedy would be to curtail the production of coal so as to meet the demands of the market and maintain a standard price to cover the cost of production.

It is well known to readers of *Coal Age* that many mine superintendents and foremen have gained preferment and financial reward through an increased output at a cost of production that practical miners know cannot be permanent. An instance of this character is given in Letter No. 4 on "Certification of Mine Foremen," *Coal Age,* Sept. 23, p. 513. A good, efficient foreman, on taking charge of a mine that has been badly managed, puts it at last in good shape. But just as the task is about completed the company replaces him with a cheaper man who is able, by working the developed area and neglecting to drive entries in advance for future development, to make an extraordinary record that is a surprise even to his blinded employers.

Inconsistent Demands on Underground Officials

In the demand for efficiency by the higher mine officials it often happens that they require, not perhaps the impossible but the impracticable. Like the ruler of old, they are asking that their mine foremen "make bricks without straw." Their cry is ever, "Do it now and keep on doing it."

I might draw attention to other points in this article: The author's remarks both on ventilation and on timbering contain many practical points but little that is new or original. In a word the drift of the article seems to describe a technical efficiency that is beyond the reach and lies much outside of the sphere of the practical man in the mine.

In closing permit me to say that coal mining is essentially an industry peculiarly affected by physical and chemical conditions that are extremely variable, and on this account it is impracticable to compel the operation of mines by a uniform standard or system. No hard-and-fast rule can be devised to meet these varying conditions. The practical mining man has made a study of these conditions and their causes and, if efficient, he will be able, in most instances, to adopt methods that are at once economical and safe.

At the close of his article Mr. Coxe advocates the employment of the most careful and efficient men available for the different positions to be filled, from the office of superintendent all the way down the line. The suggestion that confidence should be placed in the men selected for these positions is qualified by adding "especially those higher up." This qualification, in favor of the higher officials, seems unwise, reflecting as it does on the capability of the practical men in the mine.

A. M. Iner.

Johnstown, Penn.

First-Aid Training vs. Contest

Letter No. 1—Under the head of "How First-Aid Contests May Be Made More Useful," *Coal Age,* Aug. 19, p. 312, a Kentucky correspondent comments favorably upon a previous article by J. E. Butler, July 29, p. 193, entitled, "How First-Aid Training May Be Made More General." In his article, the Kentucky correspondent seems to confuse first-aid training with first-aid contests. There is quite a difference between these two features of first-aid work, to which I wish to draw attention.

First-aid training consists in a course of instruction given to a man or a body of men by a doctor or a competent instructor who is thoroughly versed in the essential requirements of first-aid work. On the other hand, a first-aid contest is a test of the contestants' knowledge of first-aid means and their application to victims of mine accidents. I am speaking now particularly in reference to mining, although first-aid instruction and work apply with equal force to almost every industry.

In the article to which I have referred, page 312, some confusion arises from the use of the words "training" and "contest" interchangeably in reference to first-aid work. The writer of the article objects to miners attending the contest as mere witnesses and gaining therefrom no practical knowledge of the work. He seems to think that a contest should be so conducted that everyone present would go away a good practical first-aid man, apparently ignoring the fact that such practical knowledge can only be gained by a thorough course of training, which is not the purpose of a contest.

It would be impossible for a contesting team to meet the requirements of the contest and perform its work in record time if the onlookers were given the opportunity of closely observing the methods by which the work was performed. They are likened to spectators at a football game. Of course, a constant attendant on a ball game will eventually obtain considerable knowledge of the game. In the same manner a witness of many first-aid contests will eventually obtain a fair knowledge of much first-aid work. However, this knowledge, without the actual training, will fall short of fitting him for the performance of the work. He needs, in addition, a course of instruction to acquaint him with many essential points that he cannot learn by observation.

Many mining companies now employ first-aid instructors who conduct regular training classes, where every man employed by the company can receive instruction in his work. By attending such classes a man is better able to enjoy and appreciate the work done by contesting teams. One feature of field contests is that they draw

the attention of many miners to their own need of first-aid instruction, and incline them to take the course that will fit them for performing the same work in case of need.

Again, the Kentucky correspondent remarks that many first-aid men never have a chance to render first-aid to an injured person in the mine, and concludes that for this reason a first-aider is apt to lose his interest in keeping up his training. This is the strongest argument in favor of first-aid contests, which in the absence of real patients injured by accident furnishes the incentive to thorough training, by the offer of prizes for the highest efficiency shown in the contest.

Last year a serious accident occurred at one of our mines, several men being severely injured. It is our custom when an injury calls for only ordinary treatment that this be given by the nearest available men who have taken the regular course of training. In case of a grave accident, however, the organized first-aid teams are rushed to the scene and the men in training act as their assistants only.

The constant study and practice required of first-aid teams in order to compete with other contesting teams is one of the chief arguments in favor of such contests, as it develops the highest efficiency in the men performing the work. On this account every encouragement should be given first-aid contests, since they not only develop efficiency in the contestants but induce many others to follow their example and fit themselves for like work.

In regard to the oral examination, the judges at the national contest last year based their decision on the answers given to the questions they asked while examining the work when removing the dressing. In this way the judge is able to tell how much a man really knows in regard to the work he has just performed. Such a plan has the advantage over any oral examination that might be held at another time.

Every Man a Star in a Well-Trained Team

As to the suggestion that the success of a contesting team may be due to the work of a star member, while the remaining men, perhaps, have an imperfect knowledge of the work in which they assisted under the direction of their leader, allow me to say that had this correspondent a better acquaintance with teamwork, he would know that every question of treatment and the application of dressings to different wounds is thoroughly understood by every member of the team, by reason of the training received in the classroom. I have often listened to heated arguments when each member in training would explain his method of treatment and tell why he thought it the best means to employ. At such times, the captain of the team and the other members would ask every possible question. This is done so that no one will be caught napping by the judge on the day of the contest.

While the suggestion that the choice for a one-man event be made by lot will meet with much opposition from teams having star performers is undoubtedly true, I, for one, fail to see any fairness in such a plan, since a man who is to perform in any event before the public naturally wants to know beforehand that he is to take such part. No one likes to be called upon unexpectedly. It is not to be supposed that, because the team has a star performer, he is the only member that understands what is required.

It is often hard to decide who is the star performer of a well-trained team. Such a one holds his reputation only by hard work, since every man on the team is competing for his place. In the stretcher drill the men work repeatedly in all positions and the results determine the final position of each man. Thus, Nos. 1 and 4 work on the trunk of the body, No. 2 at the head and No. 3 at the feet. At that time, choice is also made of those who will work in the one- and two-men events, and the training proceeds on that basis.

By way of comparison, suppose each member of a ball team thoroughly understands the game; but, by lot, the pitcher must play in the outfield, while the catcher is forced to pitch, and so on. Will such an arrangement make the team successful in a contest? While it is argued that each man should be as good as another, in the actual work in the mine each man specializes and performs the particular task for which he has trained. These arguments should be sufficient to show that the choice by lot will not develop the highest efficiency in teamwork.

Ray, Ariz. J. Frank Newton.

First-Aid and Mine Safety

Letter No. 1—I want to add a few words to the many that have already been written in *Coal Age,* in regard to boosting first-aid work in coal mining. Much has been written and spoken on this subject by the Bureau of Mines and the mine inspectors in nearly every state in the Union.

Many states like Illinois have rescue stations established for the training of men in the use of rescue apparatus and giving them needed instruction in first-aid work. Illinois has three rescue stations and three sub-stations devoted to this purpose, where classmen in every industry can receive training and instruction. Much has been accomplished through these agencies, and the number of fatal accidents occurring in mines and elsewhere has been greatly reduced. However, efforts along this line would be more successful if the service was received by the men in the same spirit in which it is given.

In my opinion the time has come for every local to set aside, say one hour each meeting night; or better, one night a month in which instruction in first-aid work can be given to every member, by thoroughly trained and competent men. Many miners could thus be taught what to do and what not to do in case of accident to a fellow worker in the mine.

One difficulty that confronts the coal industry is that men trained in first-aid work do not generally put it in practice in their daily occupations. They are not, therefore, good first-aid men. Some show quite an indifference in regard to first-aid practice. The excuses are many, and for the most part have no foundation except in the brain that conceives them. There is often a strong prejudice existing among workers in any industry in regard to receiving instruction from another. Men who have trained for a time will claim that they have all that the law requires to enable them to take the examination for mine manager (foreman), or mine examiner (fireboss).

If most of these men were called upon to bind up a slight injury, they could not apply the bandage properly. They would not be able to arrest bleeding, and a man would die from loss of blood if his life depended on the

first-aid work they could render him. When urged to take first-aid training, men frequently reply that they know more now than the instructor could teach them, and others think that instructors in first-aid work feel their importance too much. Such excuses, of course, are unworthy of consideration.

Every man should put his shoulder to the wheel in this great first-aid movement that during the past few years has been sweeping over the country from east to west and from north to south. In the words of Samuel Jones, *Coal Age*, Sept. 2, p. 376, "Instead of being a knocker, be a booster." Do what you can to push on a good work. Strive to remedy what is not right, but don't "knock" by staying away and discouraging others who, but for your knocking would swell the numbers in first-aid work in mines. INSTRUCTOR.

Springfield, Ill.

Letter No. 2—There are probably no two subjects in coal mining that are more closely associated than those of first-aid and mine safety, and none in which every person working in a coal mine should be more deeply interested. Men trained and interested in first-aid work are a strong factor in making a mine safe, because their very training and the work they must perform make them realize the terrible results of the carelessness, negligence and ignorance so prevalent among mine workers.

While first-aid work has become very popular in many mining districts, there are yet a large number of coal operators that do not encourage the work or assist in the organization of first-aid teams in their own mines. They seem to forget or ignore the benefit that the company itself would derive from a well organized and well equipped first-aid team in every mine, to say nothing of the good done the poor unfortunates who become the victims of their own carelessness, neglect or ignorance, or suffer from that of their fellow workers.

Where a company shows an interest in this work, men will always be found among its employees who are anxious for instruction and willing to become first-aiders, for they never know but that they themselves will be in need of just such first-aid. Mine accidents always come unannounced and too frequently find men unprepared. Much study and practice are required to make a good first-aid man.

In my opinion all foremen, assistant foremen, firebosses, drivers and motormen should be well trained and be able to render first-aid to injured men. Many a life depends on the giving of intelligent aid immediately following an accident in which a man or men have been hurt. Time must elapse before a doctor can reach the place, but in mines where first-aid work is organized there is always one or more first-aiders not far away who are able to do the right thing at the right moment.

In former days a man injured by an accident had to wait until a doctor could be summoned, and no one at hand knew how to stop the flow of blood or even to handle the injured one without causing great pain; but those days are past. I have seen men injured whose lives have been saved by the prompt treatment given them by first-aid men.

Little interest is taken in first-aid work in our mine. The only first-aid material, to my knowledge, is stored in the superintendent's office. There is not even a stretcher underground, and while this does not look well on paper it is the truth. The company does not operate under the Workmen's Compensation Act, but assumes its own liability for accidents.

First-aid work is the forerunner of safety in a mine and the first party to insist on safe measures and put them into effect should be the company. This work should begin in the organization of first-aid teams and the training of first-aid men. The company should supply all needed material; while the men, for their own sake and that of their fellows, should devote a portion of their time to this purpose. An effort should be made to interest every man who works in or about a mine. More than one team can be organized, but they should all practice together at least once a week, which will make them more efficient. The study and training will develop habits of greater care and caution in mining work and make the mine more safe.

Safety means freedom from danger or hazards; exemption from injury or loss. When we stop to think of the many ways in which men are injured in coal mines, it is surprising that more accidents do not happen. There are many foreigners working in the mine who do not understand how to guard themselves from danger. Besides these, there is a class of men that do not seem to care for their own safety or take any precautions to avoid being hurt. Some will even say, "If I get hurt, the company will have to pay." Such men care little for first-aid or rescue work.

MINERS' DISREGARD FOR THEIR OWN SAFETY

Many miners cannot seem to understand the necessity of taking down a loose piece of slate or standing a post under the hard slate, which they think will never fall. It would be well if the posting system adopted by the state mine inspectors was enforced by punishing men who fail to follow the instructions given. Mine officials are too lenient in regard to safety measures. Too much attention is paid to making a good showing on the cost-sheet, and this absorbs practically the whole energy of a new mine foreman or superintendent. One finds, time and again, that a mine foreman will punish a man found riding on a loaded trip or motor, while he will often do the same thing himself. If it is dangerous for men to ride on trips and motors, it is equally dangerous for an official to do the same thing.

In the interest of safety in mines and to further the work of first-aid men, I want to suggest that there should be at the shaft bottom in every mine a room at least 8x12 ft. cut in the solid coal and equipped with a couch, table and chairs or benches. It should be heated by steam and lighted by electricity and contain a cupboard well stocked with all first-aid supplies. This room should be connected by telephone with the office on the surface. Here men injured by accident could be brought while waiting for the doctor to arrive.

I would suggest, further, that there should be in every fireboss section a stretcher, woolen blanket, waterproof blanket, splints, bandages and other first-aid supplies. I have found a 10-in. pipe long enough to hold a stretcher and provided with a metal cap at each end a convenient receptacle in which to keep the stretcher and blankets dry and protected from injury. Every stretcher should be numbered so that it will be known where it belongs, and it should be returned promptly to its place.

Manor, Penn. FIREBOSS.

Inquiries of General Interest

Safe Operation of Electric Mine Locomotives

I recall that, at the last annual meeting of the State Mine Inspectors' Institute, held in June, 1916, at Joplin, Mo., the statement was made by one of the Illinois mine inspectors that a motorman in a mine in his state was electrocuted when in the act of starting the motor of a two-trolley locomotive. If I understood correctly, the motorman had pulled down one trolley pole and had placed it under the hook that secured it to the machine when the pole was not in use. He then released the other pole and placed it in connection with the trolley wire. I believe it was stated that he failed to turn off the switch connecting the first trolley with the motor and was electrocuted when he moved the switch to start the machine. Kindly explain how this could happen.

Johnston City, Ill. MOTORMAN.

This, certainly, would be a remarkable accident, and, if correctly reported, must have been due to some imperfection in the equipment of the machine. In order to secure reliable and first-hand information in regard to the possibility of such an occurrence this inquiry was submitted to Graham Bright, electrical engineer, Westinghouse Electric and Manufacturing Co., who replied in the following words:

In regard to a motorman being electrocuted, when opening the change-over switch connecting two trolleys, I fail to see how such an accident could have occurred had the equipment been properly installed.

When two trolleys are used on a locomotive, a three-way switch is applied, as I have illustrated roughly in the accompanying diagram. The center of this switch is connected to

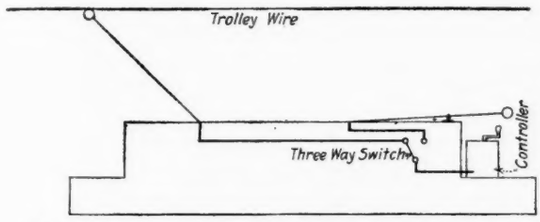

DIAGRAM SHOWING ELECTRIC SWITCH IN A TWO-TROLLEY LOCOMOTIVE

the controller, while the other two points connect with the two trolleys, respectively. Whichever trolley is up and in contact with the wire, the starting switch is thrown to connect that one with the controller, which of course cuts the current off from the other pole and leaves it dead, so that no danger could result from a person coming in contact with that trolley.

Now, assuming as stated by this correspondent that the motorman pulls down the trolley that is up against the wire and, placing it under the hook, releases the other pole and puts it in connection with the trolley wire. No current will now pass from the controller to either trolley until the switch is turned so as to connect the pole that has just been raised with the controller and, until this switch is thrown, it would be impossible to operate the car. With such a switch as I have described, it is impossible for either trolley to be alive except when in contact with the trolley wire and the switch is thrown to connect it with the controller.

If the motorman, in the case mentioned, was electrocuted when opening the switch to start the motor, it would indicate that the proper type of switch was not used. Standard practice is to use an entirely inclosed switch, having no live parts exposed, so that it is impossible for the operator to come in contact with the circuit when operating the switch. With this type of switch properly connected, as I have previously stated, I fail to see how a person could come in contact with a live part of the circuit when operating the switch for the purpose of starting the machine.

We agree fully with the opinion expressed by Mr. Bright that, assuming the motorman was electrocuted as reported, there must have been something very defective in the switch, or the fatal shock must have been received by contact with some other live part, which escaped notice at the time. As Mr. Bright states, all standard switches are inclosed in such a manner that it is impossible for the motorman to come in contact with any live part when operating the switch. Furthermore, in a proper installation of the equipment, only one trolley can be alive at one time, and that pole must be in contact with the trolley wire. We should be glad to hear further in regard to this accident as reported.

Coal Age will soon open a department of Record of Mine Accidents, which will undoubtedly prove of great interest to all coal-mining men, and should also be helpful to every man who works underground, by bringing before him constantly the fact that most of the accidents that occur in mines are avoidable.

Annealing Brittle Rails

I have often observed that rails laid in mines where electricity is used have become crystallized and are very brittle, so that any attempt to straighten such a rail, or to bend a straight rail to conform to a curve in the track, would result in breaking the rail as quickly as the bending jack was applied. I have always thought that the brittleness was caused by the influence of the electric current, where the rails were used for the return to the power house.

I would like to ask if there is any method by which such rails can be restored to their former condition so that they will be pliable and not break when bent.

Johnstown, Penn. JOSEPH HOWE.

The brittleness of the rails is not caused by the electric current. It is due to a crystallization taking place in the iron as a result of the constant pounding and vibration to which the rails are subjected in haulage.

It is possible to restore such rails by a simple process of annealing. This can be done by taking them to the surface and building a fire of old ties or waste timber and heating the rails to redness, taking care not to burn the iron by getting it too hot. There is not much danger of this in an open fire. When the rails have been heated to redness they are drawn from the fire, thrown to one side and covered with sand or loose earth so that they will cool slowly. When thoroughly cooled, the rails will be found to have lost their brittleness and can be bent as desired without breaking.

Examination Questions

First-Aid Oral Examination

(*Suggested Questions*)

Ques.—For what purposes are bandages applied in first-aid work?

Ans.—Bandages are used: (1) To bind a dressing and keep it in place; (2) to hold splints in position and bind them to a broken limb; (3) to arrest bleeding from an artery or vein by causing pressure, or to hold in place a compress to keep dirt or other foreign matter from a wound or prevent its exposure to the air; (4) to serve the purpose of a sling for the support of a broken arm.

Ques.—Describe the two most common forms of bandages used by first-aiders.

Ans.—The triangular bandage is made by folding diagonally a piece of unbleached cotton cloth 1 yd. square and cutting the piece in two in the fold. This bandage is most frequently applied by folding the point of the triangle over the middle of the opposite side, after which it is arranged in three folds lengthwise.

What is known as the "roller bandage" is made of strips of almost any suitable material 2 or 3 in. wide, and prepared in a roll ready for use when needed. This bandage is applied by winding the strip about the injured limb or part in overlapping coils so as to completely cover and protect the injured surface or bind the part together as desired.

Ques.—What is a compress?

Ans.—A compress is a piece of antiseptic gauze or cheese cloth of sufficient size to cover the wound or injured part and prevent contact of the same with the bandage. The compress is used to apply a dressing to a wound or protect the injured surface from the air. In applying a compress it is important to avoid exposing the cloth to any contamination that would infect the wound. The gauze if properly prepared has been sterilized when the germs are destroyed by heat, or it has been treated with an antiseptic, such as bichloride of mercury, for the same purpose.

Ques.—What is a splint, and for what purpose is it used?

Ans.—A splint is any rigid piece of suitable length, width and thickness that can be bound to a broken limb by means of bandages, so as to prevent the movement of the broken parts, which might cause pain or further injury by the laceration of the flesh in contact with the broken bone. While different articles, such as broom handles, canes, umbrellas, etc., are often used temporarily, a splint prepared for the purpose is to be preferred. The splint should be of sufficient width to prevent the bandage from causing undue pressure on the limb. In addition to this the inner surface of the splint should be padded with any soft material at hand in order to furnish a more uniform bearing and promote the comfort of the patient. A splint that is not so padded may cause swelling that would tighten the bandages and impede the circulation in the limb, which might result in mortification setting in. A splint should be long enough to bind the parts together so as to prevent any movement at the nearest joint as any movement there would disturb the broken bone and increase the injury, causing much pain.

Ques.—What is a tourniquet and what is its purpose?

Ans.—A tourniquet is a strap used to stop bleeding from an artery. The strap is long enough to go around a limb and has a pad attached, which is made to press on the artery at a point where the flow of blood will be intercepted before reaching the rupture. Pressure is exerted by tightening the strap. A more common form of tourniquet is made by encircling the limb with a folded bandage that is tied in a firm knot. A short stick is then inserted in the loose bandage and a pad, formed by binding a small stone or other hard substance in a clean piece of cloth, is placed under the bandage immediately over the artery at the point indicated. Pressure is exerted on the artery by twisting the stick so as to gradually tighten the bandage.

Ques.—Describe briefly what is meant by shock.

Ans.—Shock is the result of a greater or less impairment of the nervous system, which leaves the person so affected in a dazed or stupid condition, or unconsciousness may result. In this condition the face is generally pale and has an anxious or frightened look, or the eyelids droop and the patient lapses into a helpless or wholly unconscious condition, or the mind may wander while the skin becomes cold, the breathing light and the pulse rapid but feeble. Shock may result from a severe blow or other injury, or be caused by great agitation or excitement due to beholding some terrifying spectacle. An electric shock results from the passing of a powerful electric current through the body and may result in unconsciousness or death.

Ques.—On being summoned to give first-aid treatment to a person injured in a mine and finding him unconscious, how would you proceed?

Ans.—Approach the person quietly and without excitement; observe carefully his surroundings to determine, if possible, the cause of unconsciousness. Note if he has been injured by a blow or a fall and observe particularly if there is any bleeding, which should be stopped at once. Failing to find such evidence of injury, lay the patient on his back and note closely his condition. If pale and weak, keep his head low; but if his face is red and pulse strong, raise his head slightly on a soft pillow made of a folded coat. In that case give no stimulants, but sprinkle cool water on the face and chest.

If the patient, however, is pale and the hands and limbs cold, take every means to warm him and to induce circulation in the limbs and body. The best stimulant is hot tea or coffee, or a teaspoonful of brandy or whisky may be given. Wrap the patient in warm blankets, but give him plenty of air, and use smelling salts or administer aromatic spirits of ammonia, say 20 drops to a half teaspoonful in one-third of a glass of hot water in small doses after he has regained consciousness. Remember that an unconcious person cannot swallow.

Coal and Coke News

Washington D. C.

A questionaire in the Lake cargo coal case has been sent the railroads involved, by the Interstate Commerce Commission. The object of the questions is to establish the operating conditions obtaining with respect to shipments of Lake cargo coal over representative routes from the principal bituminous coal-producing districts in the territory embraced in the investigation to lower Lake Erie ports. The roads were requested to file their answers to these questions on or before Oct. 31 next.

It was stated that it will not be necessary to furnish the information as to all the different districts or for all the available routes. The information will be required only for the districts of Freeport, Pittsburgh, Connellsville, Fairmont, Cambridge, Ohio No. 8, Hocking, Kanawha, New River, Thacker, Pocahontas and Elkhorn. The instructions furnished by the commission state:

"If Lake cargo coal is assembled at more than one yard on the line of the originating carrier for shipment over the route, a representative assembling yard should be selected by the originating carrier. The information will not be required as to the other assembling yards.

"The period from July 1, 1915, to June 30, 1916, inclusive, should be covered and the information required furnished for a certain number of cars from mines in the originating district each day of the period that shipments of Lake cargo coal were waybilled. The number of cars for which information is furnished should bear some relation to the total movement of Lake cargo coal from the originating district through the assembling yard to the Lake port and should vary from month to month with the volume of the traffic moved. The returns should cover not less than 5 per cent. of the daily average movement of cars by months, with a further minimum of 2 cars per day during any month in which Lake cargo coal moved. For example: If the average daily movement of Lake cargo coal from the originating district through the assembling yard to the Lake port during the month of March was 25 cars, the returns should cover 2 cars per day for that month; if during August the average daily movement was 290 cars, the returns should cover not less than 15 cars per day.

"It is desired, among other things, to ascertain the relative percentage of empty car mileage assignable to the Lake cargo coal traffic moving over different routes, and for this reason cars should be selected which are free to be loaded at the Lake port with other commodities for a return haul. In other words, foreign cars loaded to the Lake port with Lake cargo coal to be there delivered to the owner, and any other cars not free to be loaded for the return movement from the Lake port, should not be included. Care should also be taken to select for each month of the period cars that moved from each mine shipping Lake cargo coal, or cars that moved from representative mines, in order that all the mines may be fairly represented in the returns.

"Cars loaded at the Lake port or delivered empty to foreign lines need not be traced beyond the Lake port or the point of transfer. The length of the empty return haul, if any, from the Lake port over the lines of the carriers participating in the loaded movement should be given in all cases. By 'foreign line' as used above is meant a carrier other than those participating in the haul of the Lake cargo coal from the mines to the Lake port.

"The carriers whose lines form the through route should co-operate in supplying the information called for on the forms. In the event the date cars were loaded at the mines is not shown by the carriers' records the information should be obtained from the mine operators."

HARRISBURG, PENN.

The commission named by Governor Brumbaugh to probe the advance in price of anthracite coal alleged to have been made by all the coal companies when the Roney tax measure became a law, sat in Scranton on Sept. 27 and 28 and in Wilkes-Barre on Sept. 29.

The commission is endeavoring, primarily, to ascertain whether there has been an unlawful combination of coal-producing companies for the purpose of boosting the price of coal and whether such a combination existed following the signing of the Roney tax measure. The commission is also endeavoring to ascertain whether or not the increase has been justifiable under present conditions.

Just when the advance was put on coal, the amount thereof and when it was removed, if ever, the commission is trying to find out. It is understood that the commission will request information from retail coal dealers at a later date. Alleged discrimination by railroads in freight rates against Philadelphia and in favor of New York, Boston and Baltimore was also entered into, it being understood that the alleged discrimination has much to do with the boost in prices.

On the 27th, R. L. Kissinger, secretary-treasurer of the People's Coal Co., testified that when the Roney act went into effect in 1913, his company did not raise the price of coal and when the act was declared unconstitutional it had no rebate to make.

John Phearson, sales agent for the Van Wickle Co., ascribed the advances in price to the fact that the companies were obliged to pay higher rates for labor, and that the supplies used in mining have greatly increased in price. He said the advance made by the companies to meet the Roney measure is now needed to care for the increased cost put on the companies by the operation of the Workmen's Compensation Act. He stated that this act costs his company anywhere from 6 to 10c. per ton.

At the session held on the 28th, charges that the Workmen's Compensation Act instead of working out as a piece of humanitarian legislation is proving detrimental to the safety of workmen, and that the new wage scale made between the United Mine Workers and the anthracite coal companies is tending to decrease the efficiency of employees were made by Capt. W. A. May, president of the Pennsylvania and Hillside Coal and Iron companies.

Captain May testified that there have been more accidents since the enactment of the compensation law than before. This created somewhat of a sensation among the members of the commission. "We have had 928 accidents in our collieries, 18 fatalities, in the past six months," Captain May testified. "We never had so many before in the same period." The coal-company head said he did not know whether the increase was due to carelessness on the part of the employees, knowing that they will be cared for in the event of injury, or whether the increase is due to the fact that the companies keep a more accurate record of accidents than heretofore.

The Workmen's Compensation Act and the new agreement with the United Mine Workers were given by Captain May as two of the principal reasons for the increased cost of coal production. He said that the cost of production has gone up in the past few years from 35 to 50 per cent.

Going further in his testimony and speaking in general terms of the advance in prices Captain May said that the principal of depletion of supply must be reckoned with. He said the companies are constantly eating into their capital as mine workings are becoming exhausted. He added that when a working is exhausted the improvements do not sell for more than 15 to 20 per cent. of the actual cost. He said the Workmen's Compensation Act has increased the cost of coal production 2½c. per ton.

Captain May stated further that when the Roney tax was declared unconstitutional his companies decided to refund the amount of the increase, although the companies had not made the increase to meet the Roney tax.

The testimony of W. L. Connell, president of the Green Ridge and several other coal companies, was along the same lines as that given by Captain May. He, too, ascribed the advance in price as being necessary in view of higher wages, the Workmen's Compensation Act and the increased cost of material.

Mr. Connell's testimony in relation to the Workman's Compensation Act did not agree with that offered by Captain May. Mr. Connell said his company did not find any material increase in the number of accidents. He added also that some collieries still maintain the same efficiency as under the old agreement with the employees, while in others it has been lowered.

On Friday the 29th, the commission moved down the valley to Wilkes-Barre, and heard about ten witnesses, who testified regarding their practices in fixing coal prices. The operators' testimony here was generally to the effect that the compensation act, the wage increases granted under the recent agreement, and other factors, had served to increase the cost of production to such an extent that increases in the price of coal were necessary.

Charles F. Huber, president of the Lehigh & Wilkes-Barre Coal Co., declared that he was guided entirely by his own judgment, that he had no agreement either with other operators or with retailers, when questioned as to fixing prices. He testified that he knew what coal cost to produce, that he knew what it would bring in the market, and that his aim is to get as much for his product as possible.

Other operators, when asked why the price of coal in New York is less than it is in Philadelphia, testified that coal in Philadelphia was generally sent to a special consignee, while that forwarded to New York went to an open market, and was sold for what it would bring.

It was brought out, that the coal sent to New York was inferior in quality to that shipped to Philadelphia to permanent customers.

James M. Neale, president of the Buck Run Coal and the Darwater Coal companies and affiliated with the Thorne-Neale Shipping Co., said that the compensation act placed a burden on the operators, the tax being a fraction more than 8c. per ton produced, while the 8-hr. day and increased rates to the mine employees added more than 45c. to the ton. In former years, he said, the actual cost, less the fixed expenditures, less royalties, amounted to about $1.55, while this year, the average for eight months brought the cost of production to more than $2. The cost of hauling from the foot of the shaft, as well as pumpmen and other incidentals, is proving a big item, especially in mining in lower veins.

Walter Roberts, of the Red Ash Coal Co., said that in previous years the cost of actual production was $1.85, while at this time it has reached $2.31, due to the compensation act and the recent miners' agreement. He said the efficiency of the employee is less. His company did not place an increase because of the passage of the Roney Act.

George F. Lee, head of the George F. Lee Coal Co., said his company operated in second mining. Despite the fact that this work seems more dangerous, he testified that he has experienced less accidents during the enforcement of the compensation act than prior thereto. His production is taken to market by the Delaware, Lackawanna & Western Railroad Co. He is not a member of the operators' bureau and denied knowledge that the operators fix the price of coal.

Forest Lands to Be Protected

Organization of representatives of coal companies in the anthracite region to protect forest lands owned by the corporations from fires which was accomplished recently in Luzerne County, is to be followed by meetings for a similar purpose in central and western Pennsylvania. In the anthracite region companies having operations in Luzerne, Schuylkill, Columbia, Northumberland, Lehigh and Carbon counties have agreed to endeavor to protect their lands from forest fires and the plan of organization will be urged upon the bituminous-coal operators.

The 2,000 sq.mi. of waste land in the anthracite field can be reforested so that it will yield 60,000,000 cu.ft. of lumber annually, according to George E. Wirt, chief forest fire warden of the state, who was one of the speakers at the conference between representatives of the coal companies and the Forest Department, called to devise means for again making productive the vast area that has been idle since being stripped of its virgin timber years ago.

Several of the large coal companies have already started to reforest their land.

Children Are Entitled to Individual Compensation

Judge Ferguson, on Sept. 29, decided that children whose fathers had been hurt or killed in industries are entitled to individual compensation under the Workmen's Compensation Act. The decision upholds a ruling of the board and its interpretation of the act.

The appeal was taken in the case of Matilda May Irvin, whose father had been killed. Matilda was not born until six days after her father's death. In adjusting the case the board ruled that the child was entitled to compensation in addition to that awarded the widow. The act provides that when a widow is left with one child compensation shall be paid her at the rate of 45 per cent. of the deceased's wages for a period of 300 weeks. After the expiration of this period the child shall be paid 15 per cent. of the deceased's wages until he or she reaches the age of 16 years, 10 per cent. additional is to be paid for each additional child, with a maximum of 50 per cent.

The defendant company and a casualty company contested the award, arguing that where there is a widow or widower of the deceased entitled to compensation, no award can be made to the children. Argument on the question was heard recently.

"In our opinion," the Court said, "children are clearly entitled to compensation under the act whether they receive it directly because there is no mother or indirectly if the mother exists, and upon her death, remarriage or by the limi-

tations of the act (that is by the expiration of 300 weeks), the children's compensation shall thereafter be the same as would have been payable to them had they been the only persons entitled to compensation at the time of the death of the deceased."

PENNSYLVANIA

Anthracite

Beaver Meadow—The Evans Coal Co., which for years has been operating in a small way, has leased a large tract of virgin coal land from the Lehigh Valley Coal Co. and will erect a large breaker to take care of a greatly increased tonnage. The manager of the new plant will be George Smith, who for the past 25 years has been superintendent of the Coleraine mine, operated by the A. S. Van Winkle Estate.

Wilkes-Barre—Officials of the United Mine Workers here announced that they expected to attack the recent raise in the price of domestic fuel to the miners for home consumption. They expect to base their claim on the clause in the recent new working agreement which provided that miners' supplies would remain at the old level. The operators state they do not see how coal can be classed as a supply, but the miners claim that it is and will ask for a decision accordingly.

Scranton—The Scranton Coal Co. has notified the school board that it expects to mine the coal pillars in the mine over which Public School No. 39 is erected. The school was built at a cost of $40,000 and it is feared if the company follows out its intention the building will be ruined, as were schools Nos. 16 and 19, which cost respectively $100,000 and $50,000.

With the filing recently of appeals by the Delaware & Hudson Co. and the Northern Coal and Iron Co., practically all of the big coal owners in the county have taken action which they hope will result in a reduction in the assessment of $325 per foot-acre for coal land as fixed by the county commissioners. The above-mentioned appeals cover coal land in almost every city, borough, and township in the county.

Mahanoy City—Upon entering the Maple Hill mine in advance of the other employees in order to insure their safety firebosses William Evans and Edward Burns were recently severely burned in a gas explosion.

Beaver Brook—Unable to obtain enough labor at home for the operation of its mines, the C. M. Dodson Co., owner of the mines here and at Morea, has imported a big gang of men from other sections of the state. They are being quartered in a specially prepared commissary and have their own chef.

Hazleton—Mine operators in this region are considering the plan of concentrating all available labor at certain collieries and operating them with full forces, allowing the other operations to remain idle, rather than attempting to continue all mines with short forces. The labor shortage here amounts to as much as one-sixth to one-third of normal forces, and the men who were expected to return with the return of fall have not materialized to anywhere near the expectations of the mine owners.

Plans were announced recently for the resumption of the Pond Creek Colliery, which was abandoned some years ago. Scranton capitalists have organized a new company to push the work. Electricity will be used in operating most of the machinery. The current being supplied by the Harwood Electric Co. The Evans Colliery Co., which operates a coal-mining plant at Beaver Meadow on a small scale, has leased a large tract of land from the Lehigh Valley Coal Co., and will start the erection of a new breaker.

Bituminous

Connellsville—More advantageous working conditions in the Connellsville region recently resulted in the production of 404,000 tons of coke per week, while shipments amounted to 418,000 tons. The combined coal and coke output for the week in the Connellsville region approximated 568,000 as against 538,000 tons for the week preceding.

Retail coke dealers in many places are experiencing a shortage of men for unloading cars. This is seriously interfering with their business, as demurrage charges for cars delayed frequently run into such amounts as to eliminate all profits.

Elizabeth—Coal operations are booming, but the general complaint of lack of men is still heard. Nearly every mine along the river could use more men if they were available.

Alicia—The Fleger Dredging Co., of Pittsburgh is engaged in dredging for the landing at the Alicia mine No. 2, of W. Harry Brown in the sixth pool of the Monongahela River, where a new steel tipple is in course of construction. It is expected that the dredging will not be completed before the first of the year.

Washington—An important sale of coal land recently made was that of the Pittsburgh vein underlying 13 tracts of land in Donegal Township, containing a total of about 1,512 acres. This was the property of the Allegheny National Bank of Pittsburgh. The consideration was not made public, but it is understood that it was in the neighborhood of $17,000.

Johnstown—The Victor Coal Co has purchased a mine and coal tract of Jacob Roudabush at Holsopple, and will make a new opening. About 100 men will be given employment when the plant is in operation.

The general coal trade is increasing in this section, and local operators are being kept busy. Prices are advancing and promise to even go higher before the winter sets in. The local situation is described as acute by those in touch with the retail market. House coal is difficult to obtain, is high in price and deliveries of run-of-mine coal for domestic use are uncertain. The labor question is said to be the chief cause of the trouble.

Homer City—Work is soon to be started on the erection of a number of houses for the Meco Coal Co. These dwellings are to be modern and convenient.

Boswell—The Allen Coal Co. has begun a new opening in this vicinity. The mine will be producing coal within the next two or three months, and a large force of miners will be put to work immediately. A spur of track will be built from the main tracks to the new mine.

WEST VIRGINIA

Beryl—The Davis Coal and Coke Co. has completed an uptodate playground for the children of Beryl. This is apparently much appreciated by the kiddies, who use the playground to a considerable extent.

Morgantown—The South Pittsburgh Coal Co., which recently leased 40 acres of Pittsburgh coal from Harvey Fisher at Bound Bottom, has completed the tipple and will be ready to ship coal in a short time.

Welch—L. Blenkinsopp, mine inspector in this district, has issued the following appeal to mine operators in the vicinity: "As this is the time of year that mine explosions occur, I wish to call the attention of all superintendents, mine foremen, and miners to the fact that great care should be taken as to solid shooting. The mines should be well watered down and kept moist at all times. Any neglect of the mine foreman to perform his duties according to law will be prosecuted and his certificate canceled."

Clay—The promotors of land on Middle Creek are having test holes sunk for the purpose of ascertaining if coal deposits occur on these lands, and further if such deposits are mineable.

Dorothy—The tunnel on the Cabin Creek extension was recently opened to traffic and the mines in this section will be shipping coal shortly—so far as the car supply will permit.

Fairmont—The Consolidation Coal Co.'s mines at Ida May and Caroline on Helen's Run have been put into operation. These mines are now shipping about 12 cars of coal per day.

ALABAMA

Birmingham—Miners and laborers in large numbers are still leaving this district for West Virginia and Kentucky mines and industrial fields, and a shortage of labor is already being felt at some plants in the district. Some of the negroes who left here several weeks ago are returning by foot and others are soliciting transportation from their former employers.

KENTUCKY

Central City—Finishing touches are now being put on the new tipple of the Central Coal and Iron Co., and work will be resumed at the mine immediately. Altogether as many as 250 miners have been idle since the burning of the tipple.

Paducah—At a meeting here of the Ohio Valley Coal Operators' Association it was decided by the members present to extend the sales territory to include Chicago, Texas, Arkansas, western Louisiana, Missouri and the Northwest. Judge W. A. Wickliffe, of Greenville, Ky., president, was in the chair, others present including C. F. Richardson, vice-president and general manager of the West Kentucky Coal Co., at Sturgis; George C. Atkinson, of Earlington, president of the St. Bernard Mining Co., and C. S. Brookwalter, of the Eureka Coal and Coke Co. Between 40 and 50 of the leading western Kentucky mines were represented. The association retained J. Van Dyke Norman, of Louisville, to secure rates for the association.

Whitesburg—Coal operators report much improvement in the car shortage which considerably hampered mining activity for several days succeeding Sept. 22. Carrier companies have received a large number of new cars, while old ones have been located and put into service. This is especially true of the Louisville & Nashville—other roads experiencing little trouble. Business is active all over the Kentucky coal fields. Some of the companies have orders booked for weeks ahead.

OHIO

Glouster—The shortage of cars in this vicinity is such that many mines have been compelled virtually to suspend operations, and an appeal to the Public Utilities Commission is being discussed. Operators are aggrieved over their inability to get cars, especially in view of a report that some roads operating in Ohio have leased cars to West Virginia roads.

Columbus—Three suits to recover $21,000 were recently filed by the New York Coal Co against the Sunday Creek Coal Co., the plaintiff alleging contracts for the payment of royalties which were made when it leased land in Adams and Hocking Counties were not lived up to during the past year.

ILLINOIS

Mascoutah—Fire was discovered recently in No. 1 mine of the Kolb Coal Co. It started at the face of one of the rooms originating from a blast the night before. When an examiner discovered it the flames had a good start. County Mine Inspector Thomas Wright and State Mine Inspector William Hartmann, of Belleville, were called. Under their direction brattice work was erected, enabling men to get within 90 ft. of the fire with hose. Toward the close of the day the flames were extinguished. Lack of helmets embarrassed the fire-fighters somewhat.

Springfield—The Baltimore & Ohio Railroad Co. has taken an appeal to the Supreme Court from the order of Circuit Judge Creighton, who recently upheld a ruling of the Public Service Commission that the railroad company must change its method of distributing coal cars to mines in Illinois. Attorneys for the railroad company contend that the order is unlawful and unreasonable. The company's practice has been to distribute cars to mines in proportion to the shipments received during the preceding 12 mo. The Commission ordered that the railroad company distribute the cars according to the needs of the mines without regard to the amount of their previous shipments. The railroad attorneys argue that some of the shipments are interstate and that over these the Commission has no jurisdiction.

Thirty-five county mine inspectors held a meeting here a few days ago. Appointment of "face bosses" in all the mines of Illinois was favored. The face boss inspects the face of the coal at frequent intervals to see that it is safe for the men to work. A man holding a mine manager's certificate would be eligible to serve. Some of the larger mines have the face bosses. Where they have been appointed it is said that the number of accidents has been greatly reduced. A uniform report system for the mine managers was discussed.

WYOMING

Kemerer—After lying idle for several months pending the result of bankruptcy proceedings, the old Conroy mine is once more to be opened. This mine was formerly known as the United States Coal Co. property, and is to be reopened and developed on a much larger scale than heretofore. Eight hundred thousand dollars has been borrowed by a newly organized company for the purpose of developing this mine to its fullest extent.

Foreign News

Berlin, Germany—It is stated that the war has caused a complete change in the use of native fuel, which is principally bituminous brown coal. Whereas 20 per cent. of the production was formerly converted into coke and its byproducts this has now increased to 40 per cent., and it is believed that before long the entire output of coal will be turned into coke before being used for ordinary fuel purposes. Germany will thus maintain her position as the greatest developer of the business of producing the chemical derivatives.

Personals

George H. Smith was recently appointed coal agent in the State of Utah for the Union Pacific Coal Co. He succeeds T. L. Williams.

George B. Smith has been elected general manager of the Jewell Ridge Coal Corp., of Richlands, Va. Mr. Smith has been for several years superintendent of the Pocahontas Big Vein Coal Co.

John Pororski, mine inspector of the Latham Mining Co., was severely burned recently by the explosion of a gas pocket in the entry of the mine when he entered to make a morning inspection.

William Powell, mine foreman at the Pettibone colliery of the Delaware, Lackawanna & Western R.R. Coal Department, has been appointed superintendent of the Bliss colliery by General Manager W. W. Inglis.

Thomas Whildin, formerly general superintendent for the Lehigh Coal and Navigation Co., was recently compelled to undergo the amputation of a leg because of an old accident. He is reported to be improving rapidly.

Edward Johnson, of the Lorain Coal and Dock Co., who underwent an operation at Mt. Carmel Hospital, Columbus, Ohio, recently for appendicitis, is recovering satisfactorily and will be able to leave the hospital in the near future.

J. H. Callahan was recently made general superintendent of the operations of the Byron Coal Co.'s at Mt. Claire, W. Va. Mr. Callahan has been in the employ of the company for more than four years, during which time he has given the business his undivided attention.

Benjamin Braznell, veteran coal operator who for many years was interested in Fayette County, Penn., recently celebrated his 86th birthday. Many old friends of Mr. Braznell were invited to a religious service in keeping with the day, which was Sunday, held at his home in Pittsburgh.

Robert C. Clifford, who has for the past four years been district sales manager for the United States Cast Iron Pipe and Foundry Co., in charge of the St. Louis and Kansas City offices, is now associated with the Walter A. Zelnicker Supply Co., in St. Louis, in charge of the rail department.

Thomas Cavanaugh, for 13 years transportation superintendent in the upper Monongahela Valley, for the Monongahela River Consolidated Coal and Coke Co., which was recently merged with the Pittsburgh Coal Co., has resigned his position to accept a similar one with the La Belle Iron Co., of Steubenville, Ohio.

Vincent A. Connery resigned recently from the Pittsburgh Coal Co., at Chicago, where he has been for the past 16 years, acting in the capacity of assistant treasurer and director of the Pittsburgh Coal Co. of Illinois and the Montour Coal Co., to become general manager of sales for the Miami Coal Co., with office in the McCormick Building.

Obituary

Charles E. Fultz, traffic manager and auditor of the Campbell's Creek Coal Co., died on Sept. 25, after a long illness, at the age of 54 years. He was formerly general manager of the Kanawha & West Virginia R.R. resigning to take up work with the coal company. His widow and two daughters survive him. The funeral was held at Mr. Fultz's birthplace, Rushville, Ohio.

J. F. Johnson, a successful coal operator of eastern Ohio, died recently at his home in Bellaire. Mr. Johnson's death came from poisoning resulting from ivy-poisoning, which spread through his system. When only 7 years of age Mr. Johnson commenced work in the coal mines of Mercer County, Pennsylvania, as a water bailer. He successively held the positions of trapper, driver, rodman, blacksmith, and was finally promoted to mine superintendent. He came to Belmont County in 1899 and in company with his brother entered the mining business near Bellaire. Mr. Johnson is survived by his wife, one son, one daughter and five brothers.

Industrial News

Providence, Ky.—F. V. Ruckman has purchased the Lamb Coal Co. holdings at a commissioner's sale for $1,762 and will operate the mine.

Bluefield, W. Va.—The Virginian Railroad Co. has received 30 carloads of steel, which will be used in the construction of two extensions in Raleigh County.

Huntington, W. Va.—The Chesapeake & Ohio coal loadings for the month of September will be approximately 2,300,000 tons according to semiofficial estimates recently made.

Charleston, W. Va.—The Dry Branch Coal Co. has awarded the Roberts & Schaefer Co. a contract for the installation of a Marcus patent picking table screen for installation at Dry Branch, W. Va.

Baker, Ky.—The Elk Horn By-Product Coal Co. has let contracts to the Letcher Building and Supply Co. for the erection of a goodly number of miners' houses in the new town of Gorman. The work is to start at once.

Springfield, Ill.—The State Bureau of Mines in a report recently issued, shows that 385,900 tons of coal were mined in Illinois for each fatal accident. The total coal production for the fiscal year is given as 63,673,530 tons.

Buffalo, N. Y.—At its annual meeting in Saratoga Springs Sept. 23 the New York State Coal Merchants' Association voted to meet next year in Buffalo. This city has no coal organization, but will take care of the visitors liberally.

Osceola Mills, Penn.—The Moshannon Coal Mining Co. has awarded the Roberts & Schaefer Co. a contract for coal-handling machinery for installation in an existing tipple at Mine No. 11, and also for the tipple at Mine No. 12, at Osceola Mills, Penn.

Pittston, Penn.—In their annual report to the Luzerne county court, auditors of the school district of Pittston Township state that the Lehigh Valley Coal Co. has agreed to repair all buildings in the township which may be damaged by mine caves over its workings.

Patton, Penn.—The Roberts and Schaefer company has secured a contract from the Pennsylvania Coal and Coke Corporation for the installation of a Marcus patent picking table screen, at Mine No. 33, at Patton, Penn. This is the seventh Marcus screen under contract with this company.

Washington, D. C.—The American Consul at Barcelona recently advised the State Department that the Italian bark "Garribaldi," with a cargo of coal from Baltimore to Leghorn, was sunk by a submarine Sept. 24, one hundred miles southeast of Palma de Mallorca. No Americans were on board.

Columbus, Ohio—B. F. Nigh, secretary of the Michigan-Ohio-Indiana Coal Association, announces the receipt of quite a few new members as the result of the membership campaign instituted several weeks ago. The campaign will be continued both by circular letters and later by personal solicitation.

Birmingham, Ala.—It is reported that the earnings to the State of Alabama from convict labor for the fiscal year ending Sept. 30, 1916, will be approximately $600,000, which is the record amount of revenue derived from this source. The major portion of this amount is earned by convicts employed in coal mines.

Harrisburg, Penn—The Gamble Fuel Briquette Co. has placed its product on the market. Because of the large deposits of river coal, briquetting can be carried on here extensively, and the plant will turn out from 20,000 to 25,000 tons yearly. River coal is pulverized, mixed with a binder and molded into briquettes.

Pottsville, Penn.—Alleging that culm washed into Pine Creek interferes with the operation of his mill, William Fahl, of Auburn, has asked the court for an injunction restraining the Philadelphia & Reading Coal and Iron Co., and 13 other mining companies adjacent to the water course, from dumping refuse therein.

Philadelphia, Penn.—Ocean freights still continue high, the most recent instance being the sailing vessel "L. C. Anderson," which is being overhauled in a local shipyard. This boat has a capacity of 1,600 tons and has just been chartered to load coal here for St. Louis du Rhone, France, for $15 per ton, or a total charge of $24,000.

Cincinnati, Ohio—Edward Schonebaum, receiver of the Marmet Coal Co., has reported to the superior court an offer of $18,414.41 for the Avondale real estate, owned by the company. He also reports that he has received several offers to lease the company's mines at Marmet, W. Va., and recommends that one of these offers be accepted.

Birmingham, Ala.—The towboat "Volcano," belonging to the Debardeleben Coal Co., which recently struck an obstruction in the Warrior River and sank, is now on the ways at Tuscaloosa and will be placed back in commission shortly. This company has chartered three self-propelled barges from the Alabama & New Orleans Transportation Co. for use in Mobile and New Orleans trade.

St. Louis, Mo.—The car shortage is becoming acute in Illinois. Operators are finding it difficult to obtain more than half as many cars as they need. It is seldom that enough cars are received for an entire day's work. Few mines are working more than half time and it is feared that some will have to reduce the working time still more. One cause of the shortage is declared to be that coal cars are being used for the transportation of other kinds of freight.

Charleston, W. Va.—T. L. Lewis, secretary of the Splint Gas Coal Association of West Virginia, is quoted as of the opinion that a coal shortage is virtually certain during the winter months, on account of the curtailed output of West Virginia mines due to the car shortage and other causes. The inability of operators to secure cars and men, together with the heavy demand for coal all over the country, are combining to create an unusual situation, according to Mr. Lewis.

Philadelphia, Penn.—The Girard Estate, the principal wealth of which consists of anthracite mines leased to operating companies, is beginning to feel the general prosperity, as evidenced by the report of the trustees for the period from Jan. 1 to Aug. 31 last. During that period the net receipts from the mining lands amounted to $821,974, being an increase of $205,845. During the same period the net income from properties within the city was $343,667, or a decrease of $574.

St. Louis, Mo.—A controversy has arisen among river men anent the useability of the projected municipal dock which may delay its completion. Some of the steamboat men say that the dock as planned will not admit of use by their boats. Others say the plans are all right. The plans call for a combination of horizontal and vertical dock, intended to make it adaptable to different stages of water. The Board of Public Service has decided to postpone awarding the contract until the views of the steamboat and barge men can be obtained.

Huntington, W. Va.—Within a short time the remainder of a shipment of one thousand 70-ton steel coal cars will be received by the Chesapeake & Ohio Railroad Co. These cars are being shipped by the Pressed Steel Car Co., of McKees Rocks, Penn. During the past month approximately 700 cars have been received. The remaining 300 will arrive shortly. It is also said that the Chesapeake & Ohio has contracted for another thousand of these cars to be delivered before Jan. 1, 1917. During the past year 3,000 coal cars have been delivered to the line.

Birmingham, Ala.—The Pratt Consolidated Coal Co. has closed a contract with the State of Alabama for a term of five years from Jan. 1, 1917, for the mining of coal at Banner mines by convict labor. From 400 to 450 convicts will be employed, and it is understood that 68c. per ton will be paid for the delivery of coal at the mouth of rooms, which is an increase of 3c. over expiring contract. However, it is said the state assumes certain obligations which will practically offset the small increase in rate. The state has entire charge of the working and maintenance of the convicts.

Washington, D. C.—Complaint was filed with the Interstate Commerce Commission on Sept. 27, by the North American Coal Co., with mines at Madesville, W. Va., against the Monongahela Railway Co. and others. The Monongahela Railway is alleged in the complaint to be the only outlet for coal from the mines of complainant, while its rates are alleged to be greatly in excess of those over the Baltimore & Ohio R.R. across the Monongahela River. A reduction in rates and reparation equaling the overcharges on coal hauled since July, 1914, are asked in the complaint filed.

Steelton, Penn.—Contract for the erection of a new battery of 60 coke ovens with byproduct apparatus at the local plant of the Bethlehem Steel Co., has been awarded to the H. Koppers Co., Pittsburgh. Work on the new battery of ovens will start at once and will be completed in 12 mo. The added capacity will make possible the production of an additional 700 gross tons of coke every day. At present the Bethlehem company operates three batteries of 40 ovens, each at the local plant. The present batteries, however, are of the Semett-Solvay type. The agreement with that concern has expired.

St. Louis, Mo.—The Illinois Traction Co. has filed with the Missouri Public Service Commission application for an order directing the Terminal Railway Association to permit the traction company to connect with the Terminal tracks near the west approach of the McKinley Bridge in St. Louis. The petition states that the company is entirely without St. Louis terminal connections. Terminal officials say they will oppose the application on the ground that the traction company can deliver cars to the Terminal Association at Granite City, on the Illinois side. There are a number of coal mines on the traction lines and the company expects, if the connection is obtained, to deliver a large quantity of coal in St. Louis.

Drifton, Penn.—Public bequests amounting to $880,000 have been left to various institutions by the will of the late Eckley B. Coxe, Jr. The income of $500,000 will be applied to the use of a museum of the University of Pennsylvania. The Children's Hospital in Philadelphia will benefit to the extent of an endowment of $100,000. Besides this sum, $10,000 is to be set aside the income to be applied for Christmas presents and an annual dinner at the hospital for the children, nurses, servants and the dispensary staff. A sum of $25,000 is left to the Mining and Mechanical Institute of Freeland. The United Charities of Hazleton is also remembered with a bequest of $15,000, the income from which is to be used to continue the salary of a nurse.

Washington, D. C.—Spain is providing for quicker distribution of coal, according to information just divulged by the Department of Commerce. This information comes from Consul General Hurst, stationed at Barcelona, who reported: "The scarcity and high price of coal in Spain has led the Government to present a law to the Cortes, the provisions of which, it is hoped, will relieve the local fuel situation. Pending enactment of the proposed law the Government, by royal order, published Aug. 19, has made regulations adapted to overcome some momentary difficulties.

It appears that at Barcelona there are large numbers of cars loaded with coal which have been refused acceptance by the consignees owing to the poor quality of the coal. This practically immobilizes cars absolutely necessary in moving coal from the mines to industrial centers of the country. Accordingly, the railroads transporting the coal will be obliged to demand a certificate from the mine whence the coal proceeds showing quantity, to whom consigned, and by whom, so that in case it is not of the grade ordered the consignee may take up the case with the shipper. If the coal is not discharged by the consignee within 12 hr., the railroad company will proceed to unload it at the expense of the consignee, without responsibility for loss or damage, unless this can be attributed to bad faith or negligence of employees.

Each individual shipment must be kept separate, in order to permit the consignee to claim indemnification from the shipper. If the docks and freight yards of the transporting company are not large enough to permit of separately storing these shipments, more space may be rented at the expense of the consignee. Each coal-transporting company must reserve a certain number of trains for coal, which they shall load to the maximum, and they shall inform the Ministry of Public Works within 15 days as to the number of cars needed by them for this purpose. In this way it may be arranged, if necessary, for one company to lease cars from another that has no immediate use for them.

Market Department

GENERAL REVIEW

Anthracite tight and fully controlled by the selling interests. Bituminous continues to advance with no indications of a halt. Confident predictions of still higher prices in the Lake sections. Middle Western operators swamped with orders and prices fluctuating over a wide range.

Anthracite—The first cool weather of the season has stimulated interest among domestic buyers and given a fresh impetus to a market already abnormally active. It is exceedingly difficult to pick up any extra tonnages, as producing interests are hard pressed to meet their contract obligations. Dealers with short storage room are already practically out of stock. There are some conservative observers who still consider the current situation as fictitious, and predict a reaction, but there is no doubt that the market at the moment is entirely in control of the sellers. On all negotiations, the main question at issue is time of delivery, quality and price being secondary considerations. The situation at outlying points, particularly in certain down East sections, is especially serious, stocks in some instances being only about half normal for this period of the year and with little time left before navigation closes. In the Middle West supplies have practically disappeared and there is scarcely any company that will accept an order while there are rumors of premiums of as much as $1 per ton being offered without bring out any coal. Shippers are already beginning to sell next month's production, and the market has never before been more active except possibly when a serious strike threatened.

Bituminous—Each week sees new record prices established in all sections, and there are still no indications that the top of the market has been reached. Buying continues of the most vigorous character, and any quotations made are understood to be for only a 24-hr. period. Evidence of the acute anxiety among the consuming interests is seen in the numerous buyers, who are canvassing the mining regions for extra tonnage. In view of the fact that substantially less than the normal amount of coal was placed under contract last April, operators generally have more than the customary amount of free tonnage on which they should be able to realize handsome profits. The only definite prospects for any relief at the present time are when Lake shipping begins to slow down in the next month or six weeks. The situation at down East points continues tight, though probably it has been accentuated by the anxiety of dealers to be assured of their full requirements.

Lake Market—Urgent requests for coal from the East are being received in this market, and this has tended to crowd prices up to still higher levels. Apparently, other districts are falling down in keeping their regular markets supplied, and confident prophesies of still higher prices continue. There is an obviously stronger demand than for a number of years at this season, and the anxiety of consuming interests as to the outlook for supplies is reflected in the constantly advancing prices. Some operators consider themselves fortunate to be able to meet 75 per cent. shipments on their contract obligations. Lake shipments are not heavy because of the scarcity of coal, and it is expected that only a small additional tonnage will be released for the general market when navigation closes; this additional outlet for coal, however, serves to make the selling interests even more independent concerning business offered. The demand is general throughout all industries.

Middle Western—Operators have been swamped with such a mass of orders that they are now hopelessly behind. The situation has resolved itself into one of getting supplies, and buyers show little inclination to question either quality or prices where shipment can be assured. There is a steadily expanding market in the Northwest, Illinois operators shipping districts never before reached by them. Prices are fluctuating over a wide range and occasions have been noted where the quotation has advanced 25c. when there is any appreciable interval between the original inquiry and final placing of the order. Colder weather is stimulating interest in the retail business, while dealers' stocks are substantially below normal and a severe winter may see one of the greatest shortages of coal in the history of that section. Large consumers are, as a rule, well protected by their contracts and also have some reserve stock, but many of the smaller buyers are finding it hard going.

A Year Ago—Colder weather releases more anthracite orders. Strong constructive features in the bituminous market. Export trade dominated by vessel situations. Large movement from upper Lake ports. Middle Western trade satisfactory.

BUSINESS OPINIONS

Boston News Bureau—The summary of business conditions as of Oct. 1, reported by the 12 Federal Reserve Banks, shows that trade throughout the country is at top notch and people optimistic. Only in Atlanta, which awaits a more decisive cotton-crop condition as a basis for fall and winter business, is a note of hesitation sounded. With all the tremendous business activity money is everywhere plentiful. Notwithstanding the activity in general trade and speculation, we continue to absorb foreign loans. The city of Paris loan of $50,000,000 was largely over-subscribed. A great deal of new business will be given out after election, especially if Hughes wins out. Plans are already being made to that end.

Iron Age—Heavy buying of pig iron, accompanied by price advances on top of those of last week, is the outstanding feature of the iron market. It comes while evidence is accumulating of the trend of finished steel to still higher prices. Export demand is partly responsible in iron, as it has been in steel, but, with high levels regarded as certain for months to come, domestic purchases, one after another, are, after repeated postponements, being brought forward. In the face of a shortage of labor for the increased business, the mills have difficulty in adding to production and shortening deliveries, yet buyers could use more material; the result is the growing price strength. The greatest activity has occurred in Bessemer and basic pig iron, which have risen $1.25 per ton in two weeks.

Dun—Restraining influences hamper but do not check progress, current reports adding to the accumulated evidence of prosperity in industry, trade and transportation. Holiday observances have had the usual effect of temporarily limiting business in some branches and labor conditions still restrict manufacturing operations; yet bank clearings at most leading centers, as well as at the smaller cities, mount upward steadily and other statistical barometers also make remarkably gratifying exhibits. Commercial failures this week in the United States, as reported by R. G. Dun & Co., are 284 against 289 last week, 264 the preceding week, and 331 the corresponding week last year. The high and rising prices constitute a source of complaint and cause some hesitancy in forward commitments, but the purchasing power is sustained by the full employment of workers at advanced wages and signs of contraction in consumption are the exception. It is noteworthy that demands are broadening in practically every direction, following the partial let-up in midsummer.

Bradstreet—Trade reports are all in superlatives, and the United States enters the last quarter of the year with a record of past achievement and future promise such as neither this nor any other country has ever before seen. Old measures have been surpassed, and the business world is without a yardstick capable of measuring the present or the future of the country's development. War demand, the original lever of progress, is still in evidence, but in some lines purely domestic demand is now such as to give full occupation to productive energies, and given the continuance of the war abroad, no apparent change can be forecasted at home. Trade is active, more so than ever, industry is still at capacity limits, commodity prices are at new high levels, bank clearings break all records for this time of year, export trade is doing likewise, and so large is the volume of orders booked ahead that producers rather than buyers are now in many lines picking times and places of delivery. Staple goods are wanted for immediate use, for next winter and for the spring of 1917.

Marshall Field & Co.—Current wholesale distribution of dry goods shows large gains over the corresponding period of a year ago. Road sales for both immediate and future delivery continue to maintain the heavy volume of the past few weeks, and exceed those of a year ago by a considerable margin. Merchants have been in to market in considerably larger numbers. Collections are in excess of the week last year. Prices are firm.

American Wool and Cotton Reporter—Sales of wool last week totaled 10,000,000 lb. There were more buyers than sellers and more or less speculative buying on the part of the dealers who are anticipating higher prices. Territory wools predominated in the sales, and delams were also in demand. There was some business in crossbreds. Interest in the lightweight season of woolen and worsted goods has declined, largely due to the between-seasons period. The sellers of fancy worsted are not worrying about cancellations. Poplins and serges have been in good demand. The export trade is having an influence in the women's-wear market.

Atlantic Seaboard

BOSTON

Pocahontas and New River very firm. Loading despatch fair, but agencies shy of accepting extra boats. Export and bunker demand still brisk and delivered prices continue high. Georges Creek deliveries negligible. Anthracite still farther in arrears.

Bituminous—As in the case of all other grades the Hampton Roads coals, if anything, show even greater strength than a week ago. Shippers trying to clear cargoes find it increasingly hard to secure small lots at the piers and are forced to pay higher prices; $4.50 has been paid in such cases and apparently there is no prospect of the market softening. The bulk of the receipts at Tidewater will continue to be applied to contracts for some months to come. Most of the agencies have so far been fairly well able to keep up with obligations at this end; although some of the smaller contracts calling for barge delivery have been subject to delays.

Export and bunker trade continue brisk, with no let-up in the demand. The result is that most of the shippers are indifferent to the spot demand from this territory, the impression being that it aggregates only a small tonnage. For the most part the inquiry comes from large consumers who either neglected to cover all the usual supply or find their consumption notably increased. A portion also comes from buyers who contracted for grades other than Pocahontas or New River. The spot market here is rather slower developing than might be supposed. Six dollars is now considered a fair market price for the smokeless coals alongside Boston, although a few anxious buyers would send it to $6.50 in short order. The latter figure is about the basis alongside at points like Portland and Bangor.

The fact is that cargo sales are only scattering, and that only small lots are being sold for distribution inland. More than one Tidewater agency is buying all-rail Pennsylvania coal to ease up the demand on them for spot coal at the various distributing points. So far there have been only a few cases of distress among consumers, and part of the mild "flurry" to this point has been due to the anxiety of dealers to cover on coal they feared they might not be able to get a month or two hence.

Georges Creek shipments are at the dead minimum. The largest shippers continue to have trouble moving their fleet and car supply and shortage of miners are still affecting receipts at the piers. None is available at New York or Philadelphia, at least for coastwise shipment; practically none is offered on the market here, and deliveries on contract are months behind.

The Pennsylvania grades are all up another notch in price as a result of the week's trading. Most operators in Cambria and Somerset have only small tonnages to sell now and then, their output being cut down to about what they can get cars for to ship on contract obligations. It never was any harder getting coal and boats together. At times lately there have been genuine flurries over spot coal at the piers and very little said as to quality.

Bitumjnous quotations at wholesale, f.o.b. loading ports at points designated, are about as follows, per gross ton:

	Clearfields	Camb. & Som's't	Geo'gs. Creek*
Philad'la...	$3.00@3.60	$3.25@3.90	$3.07@3.17
New York..	3.30@3.90	3.55@4.20	3.37@3.47
Baltimore..	.....	.....	3.00@3.10
F.o.b. mines	1.75@2.35	2.00@2.65	2.00@2.10

* On contract.

Pocahontas and New River are quotable all the way from $4@4.50 f.o.b. Norfolk and Newport News, Va. On cars at Providence $6.25 is about the price on the same grades, and $6.50@6.75 f.o.b. cars Mystic Wharf, Boston. Ordinary Pennsylvania coals have sold at $6 alongside Boston.

The Boston retail price on bituminous was advanced Oct. 2 from $5.50 to $6 per net ton delivered.

Anthracite—No improvement is noticed in the deliveries here of domestic sizes. While the Boston dealers are managing to get along for the present on what shipments they get there are other cities where the situation is serious. Retailers on the Kennebec and Penobscot Rivers have not yet had half their normal supply and only about two months can now be relied upon for shipments before navigation closes. Delays increase all along the line, although the weather

throughout September was favorable to the movement of twos. Loading is slow, and shippers are struggling to get both a better allotment of cars for Tidewater and a better assortment of domestic sizes. Broken, egg and stove are very short, and where consignees are unwilling or unable to modify their schedules the barges are in many cases allowed to wait idly at the piers while the coal goes in other directions.

Some dealers have already begun mixing chestnut with stove in the effort to make the latter cover more ground. In order to clear barges more than one consignee has had to accept a cargo either all chestnut or part chestnut and part pea.

All-rail deliveries are slowing up materially. On some lines the dealers are getting as short in proportion as those on Tidewater. It certainly looks as if New England were in for a hard season. Only mild weather can make very much difference now in the stocks to be carried through.

PHILADELPHIA

Anthracite given added impetus by cold weather. Heavy demand for broken and egg active. Urgent call for stove, with shipments far behind. Storage pea coal being shipped. Buckwheat strong, with some at $2. Bituminous prices continue upward, $3 being reached in several instances. Car supply 50 to 60 per cent. requirements.

Anthracite—The first frosty weather of the season is giving added impetus to the already brisk market. The coal ranges are being started and in addition a large percentage of the householders have found it necessary to fire up their heaters. This has thrown an added demand on the much hurried retail man at a time when he is booked far in advance with orders.

The demand from industrial plants for broken coal continues out of all proportion to the supply. It is not now a question of price and many users of this large size, particularly the gas companies, are falling back on egg at an additional cost of about 55c. to 65c. per ton in addition to diminished results. This is naturally increasing the demand for the egg size, which is already active. Rumors that premiums are being asked for this last size persist, but so far have been difficult to confirm.

There is not the least cessation in the demand for stove and there is no question now that there will be times this fall and winter when the consumers' stove bins will be empty Already the dealers are trying to assist the shippers by persuading their customers to substitute either egg or chestnut. The smaller dealers who have poor facilities for carrying stocks are practically out now and the larger ones are making desperate efforts to replenish their diminishing supplies.

Chestnut has gained rapidly and October requisitions show a large increase over this time last month. The price, too, has stiffened and circular rates prevail. We know of a few instances where retail dealers doing a large volume of business are actually short of this size.

If pea coal continues to be absorbed as rapidly as it has been this week, it too will soon be in short supply. One of the big companies which has hesitated about shipping storage coal picked up 25 cars a day this week, chiefly for consignment to the local trade. Should this continue this source of supply will soon be exhausted, as the amount dumped in storage the past summer was far below normal.

The activity in the bituminous market continues to boost the anthracite steam sizes and it is very difficult to buy any buckwheat now for less than $2, which is 45c. higher than contract price and 55c. more than the circular rate. However, there is very little free buckwheat to be had, as this size is particularly well contracted for, though the smaller steam sizes are still available at almost normal figures.

Surveying the general market at the moment it appears that all shippers have already taken as much October business as they will be able to ship the entire month. This is particularly true of all the big companies, but there is a suspicion that some of the individuals may be holding back to take advantage of the main chance. Except when a strike was imminent there probably has never been such a desire on the part of buyers to stock up and the operators are swamped with orders and requests to hurry shipments.

Some of the more conservative dealers who refuse to become excited over the present conditions say there is sure to be a reaction in this market. They argue that before the end of this month the householders who buy their winter's coal in advance will have been supplied and this will leave them only the one- and two-ton transient business from small buyers for November.

The improvement in collections has been remarkable and all interests seem to realize the necessity of keeping their accounts in good shape. It is a fact that salesmen's pleas for delinquents are absolutely ignored, and it appears to be an opportune time for the retailers to educate their trade along the same lines.

Circular prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.75	Buck	$1.65	$2.55
Egg	4.15	5.25	Rice	1.00	1.90
Stove	4.40	5.60	Boiler	.90	1.80
Nut	4.50	5.55	Barley	.75	1.65
Pea	2.80	3.70			

Bituminous—There is no cessation in the upward movement of prices, and now $2 coal has practically passed out of the market, except a small quantity of very inferior grades. The price increases have ranged from 20c. to 60c. per ton, the biggest changes being noted in the best grades. For the first time during the present season $3 has been recorded for several grades and the prediction is openly made that within two or three weeks there will not be any coal selling under that price. At the present time there is a fair supply coming into the city, but orders are far from being filled. The greatest activity continues to be at the piers.

Mine owners on the lines of the Pennsylvania R.R. report the car supply to be about 60 per cent. of their requirements, while B. & O. operators claim to be receiving but 50 per cent. of their needs. Brokers are finding it extremely difficult to get coal. So far as local industrial plants are concerned there is no actual shortage reported and at this moment salesmen within the city district are even finding it difficult to get orders. This seems to bear out the theory advanced for several weeks past that most of the buying is for outside shipment, although the supply departments of the railroads centering here are still using vigorous methods to increase their stock of engine fuel.

At present it is manifestly an operators' market and as the contracting last April was in lesser volume than for many years the mine owners are having an opportunity to make good profits. However, no one hears of any operation working to capacity, as the labor supply has far from improved. Many operators were depending on the closing of the farming season to recoup their labor needs, but even this has failed to materialize.

We give below a list of prices per gross ton f.o.b. cars at mines, which will give an idea of the present price situation, but it must be borne in mind that rapid changes are taking place and no one is quoting figures for longer than a single day at the very most:

Georges Creek Big Vein	$2.90@3.10
South Fork Miller Vein	2.85@3.00
Clearfield (ordinary)	2.50@2.60
Somerset (ordinary)	2.50@2.60
West Va. Freeport	2.35@2.45
Fairmont gas	2.20@2.35
Fairmont gas, mine-run	2.10@2.15
Fairmont gas, slack	2.00@2.10
Fairmont lump, ordinary	2.15@2.25
Fairmont mine-run	2.05@2.15
Fairmont slack	2.00@2.10

NEW YORK

Individuals get premiums for domestic coals. Steam grades hold firm. Prices advance on bituminous with heavy buying. West taking large tonnages and railroads and large consumers are in the market for free coals.

Anthracite—With all prepared coals scarce the demand for anthracite continues heavy and dealers who did not have the foresight to make arrangements for supplies for the year, are paying premiums as high as 75c. With the call for supplies growing steadily there are those in the trade who predict premiums of more than $1 for the larger sizes within the next week or ten days.

Stove coal is causing more trouble than either egg or nut. Most companies and many individuals are booked up for this size and refuse orders unless other grades are taken at the same time. All new business is being turned down by the companies as they are hardly able to take care of their regular trade. Buyers from New England and Long Island points are numerous and buying is heavy.

The demand from the West is stronger and with the increasing scarcity of chestnut there is a heavy call for pea coal.

Local shippers are short and demand is such that large orders are refused. Line trade is active and car supply is so bad that complaints from inland dealers are frequent.

There is an active demand for the steam coals but they are not keeping pace with the other sizes. Supplies are short and shipments slow. Buckwheat No. 1 is not plentiful and good grades are quoted at 25c. more than under ordinary conditions.

Current quotations per gross ton, f.o.b. tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	$4.95	.....
Egg	5.45	$5.45@6.00
Stove	5.70	5.70@6.50
Nut	5.75	5.75@6.25
Pea	4.00	4.00@4.25
Buck	2.75	2.75@3.00
Rice	2.20	2.20@2.25
Barley	1.95	1.95@2.00
Boiler	2.20	.....

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—The trend of prices continues upward. Demand is strong with supplies short and buying is heavy at the mines. Large consumers are in the open market for extra tonnages.

Numerous buyers are visiting the central Pennsylvania fields for free coals. It is predicted that producers in the Pittsburgh and Youghiogheny districts are 20 per cent. behind their contracts with no prospects of being able to make up this deficiency.

No relief is looked for in the east until after the close of Lake navigation. Buying for New England account at the mines is heavy and mine quotations range from $2.70 to $3 for central Pennsylvania coals. Quality is more or less ignored and time of delivery is the chief point of contention. Car supply remains bad, few producers getting more than 50 per cent. of their quota.

At New York Tidewater the cheapest coals are being held at from $4 to $4.20, with better grades 20c. to 50c. higher. Tidewater prices are lower than the mine prices.

Bunker coals are in good demand while export shipments would be heavy if it were possible to get bottoms. Good steam coals are being held at from $4.10 to $4.20.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades are as follows:

	South Amboy	Port Reading	Mine Price
George Crk. Big Vein	$4.50@4.75	$4.50@4.75	$3.00@3.50
Tyson	4.25@4.35	4.25@4.35	2.75@3.00
Clearfield	4.15@4.25	4.15@4.25	2.70@2.80
South Frk.	4.25@4.35	.....	2.85@3.00
Nanty Glo	4.25@4.35	.....	2.85@3.00
Som'r. Co.	4.15@4.25	4.15@4.35	2.70@2.90
Que'ho'ing.	4.25@4.35	4.25@4.35	2.85@3.00
W. V. Fa'rm't Th'r'qua.	4.20@4.30	4.20@4.30	2.60@2.75
Mine-run	4.10@4.20	4.10@4.20	2.40@2.60
West. Md.	4.10@4.20	4.10@4.20	2.60@2.70

BALTIMORE

Market excited and prices steadily advancing. Anthracite situation grows tense also, and first talk of premiums is heard.

Bituminous—The most exciting market for months, except for the brief period when a railroad strike seemed sure, faces the coal trade. Prices have advanced steadily for all classes of soft coal until they stand on about the same basis all along irrespective of grade. Steam coals are bringing anywhere from $2.50 to $2.75 at the mines to the trade, and are readily taken at those figures, while gas coals are generally bringing around $2.50. There is comparatively little screening of coal now and this has sent slack up along with the other grades.

The mining regions are alive with purchasing agents, who take over the coal as fast as loaded. Mines generally are allowing a pro rata arrangement on contracts in relation to the number of cars of their allotment delivered for loading. It is the traders' market that has undoubtedly caused most of the price flurry. It is impossible to set a definite price list under existing conditions, as each sale has its own schedule.

Anthracite—The market has been affected by the wretched car supply and is tight in the extreme. Induced by almost cold weather small buyers are urging deliveries. Larger consumers too, realizing that car conditions are not likely to improve at once, are calling for supplies. For the first time there is talk of premiums for early deliveries in some cases.

Exports—The export demand became more brisk the past week. There was some delay in loading at times and some outside purchasing to complete cargoes. During the week a total of 26,019 tons was loaded for cargo, 1,905 tons for bunker.

HAMPTON ROADS

Shortage still acute. Export and coastwise movement light. Few charters reported. Prices firm. Stocks below normal.

All shippers are still suffering from the shortage of the past thirty days, with no relief in sight. The mines are short of labor and cars, which of course reduces the output materially. Contract business is taking most of the tonnage and little coal is available for new business.

The export and coastwise business of the past week has been comparatively light on account of the coal shortage. Chartering is light, few recent closures being reported, both in the offshore and coastwise business. The six-masted schooner "Addie M. Lawrence" has been in port for the past two weeks seeking a charter, but has not yet been closed. There are also several foreign sailing vessels here unchartered. The Panama R.R. collier "Ulysses" loaded at Sewalls Point on Sept. 30, taking some 13,000 tons for Cristobal, Canal Zone. The demand at the Canal has now become so heavy that it is reported two more colliers are to be built to carry coal from Hampton Roads. The large Leyland liner "Winifredian" is loading coal for the Plate. The Norwegian steamer "Wascana" loaded on Sept. 28 with 7,200 tons for Rio but the captain refuses to sail until the shippers furnish him with the name of the consignees, fearing that he may get his steamer blacklisted.

Prices are still advancing, and while there is not much tonnage moving except on contract, whenever any coal is sold at the market the price invariably shows an increase. The prices reported each week are based on actual sales. New England prices for Pocahontas and New River show the same degree of increase. At present for prompt delivery prices are as follows: Pocahontas

and New River for cargo $4.50@4.75 per gross ton, on track for local consumption $4@4.25 per net ton, for bunkers $5@5.10 per gross ton plus 10c. per ton trimming. Stocks are away below normal on all of the terminals.

Hampton Roads dumpings for the month of September were: Norfolk & Western, 664,773 tons; Virginian, 363,178 tons; Chesapeake & Ohio, 371,951 tons; total, 1,399,902 tons. This shows a falling off of some 200,000 tons as compared with August, due to the shortage of coal throughout the whole month. The Virginian shows the smallest loss, the September figures being only some 20,000 tons below August.

Railroad Tonnages—The following is a comparative statement of the tonnages handled by the different roads for the weeks ended Sept. 30, 1915-16, and for the first 14 weeks of the last half of the years:

	Week		14 Weeks	
	1915	1916	1915	1916
Nor. & West...	131,055	119,917	2,508,644	2,234,109
Ches. & Ohio..	72,996	92,120	1,312,913	1,323,096
Virginian.....	59,997	89,623	949,147	1,199,527
Total.....	264,048	301,660	4,770,704	4,756,722

THE PANAMA CANAL

Only one steamer with fuel passed through the canal during the week ending Sept. 16, that being the "Foreric," with 5,000 tons of coke from Norfolk to Valparaiso. The total coal shipments through the canal for the month of August amounted to 83,523 gross tons, and coke shipments were 14,436.

Ocean Shipping

OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

PHILADELPHIA

Vessel	Destination	Tons	Rate
C. K. Scull	Martinique	1,300	
A. W. Robinson	Porto Plata		

BALTIMORE

Sangstad	Preston & Banes	[2]1,459	
Tremeadow	River Plate	2,335	
Holly Branch	River Plate	2,215	
Wilhelm Colding	Port Limon	931	

VIRGINIA

Joel Cook	Bermuda	319	$4.25
Winifredian	Bahia Blanca	6,817	12.60
	Bahia Blanca	[1]7,700	12.60
Lundy	Rosario	1,779	14.16
Iolanthe	Buenos Aires	1,943	13.80
Ocland	Havana	1,874	
Frontera	Kingston		
Bessie Whiting	San Juan, P.R.		5.25
Gwendolen Warren	Kingston	3,597	9.60
Nankai Maru	Chili	2,337	12.50
Bjornefjord	Rio Janeiro		

NEW YORK

Myrtle Leaf	Nova Scotia		
Bella	St. John, N. B.	769	

[1] To 8,500 tons. [2] Coke.

OCEAN FREIGHTS

The condition of the freight market is practically the same as a week ago, but in some instances quotations given below can be shaded for prompt tonnage. We would quote freight rates on coal by steamer as follows:

	Sept. 25	Oct. 2
West Coast Italy....	$27.60@28.80	$25.20@26.40
Marseilles.....	25.20@26.40	22.80@24.00
Barcelona*[2].....	22.80@25.20	20.40 about
Montevideo.....	13.20 about	13.20 about
Buenos Aires.....	13.20 about	13.20 about
Rosario.....	14.40 about	14.40 about
Rio Janeiro.....	12.00 about	11.75 about
Santos.....	12.50 about	12.00 about
Chile (good port)....	9.00@10.00	9.00@10.00
Havana.....	3.75@ 4.00	3.50@4.00
Cardenas, Sagua....	5.00 about	5.00 about
Cienfuegos.....	4.50@ 5.00	4.50@5.00
Port au Spain.....	6.00@ 6.50	6.00@6.50
St. Lucia.....	6.00@ 6.50	6.00@6.50
St. Thomas.....	5.75 about	5.25 about
Barbados.....	6.00@ 6.50	6.00@6.50
Kingston.....	4.50 about	4.50 about
Curacao[1].....	5.75 about	5.75 about
Santiago.....	4.50 about	4.75 about
Guantanamo.....	4.50@ 5.00	4.50@5.00
Bermuda.....	4.50 about	4.50@5.00
Vera Cruz.....	5.50@ 6.00	5.50@6.00
Tampico.....	5.50@ 6.00	5.50@6.00

* Spanish dues for account of cargo. [1] And p.c.
[2] Or other good Spanish port.
W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past week:

NORFOLK

Vessel	Destination	Tons
Silvia[1]	Porto Ferrajo, Italy	4,939
Ocland[4]	Havana, Cuba	4,789
Margarita[3]	La Plata, A. R.	2,501
Brighton[3]	Santiago, Cuba	970
Caprera[1]	Porto Ferrajo, Italy	5,005
Carnmoney[3]	Montevideo, Uruguay	1,845
Wien[5]	Porto Padre, Cuba	2,861
Dominic[7]	Pernambuco, Brazil	1,912
Helmer Morch[6]	Montevideo, Uruguay	3,049
Wascana[5]	Rio de Janeiro, Brazil	7,198
Juno[6]	Italy (Any port)	5,124
Ulysses[3]	Cristobal, C. Z.	12,039

NEWPORT NEWS

Flimston[2]	Rio de Janeiro, Brazil	7,660
Skogstad[2]	Cienfuegos, Cuba	5,551
Dustin G. Cressy[9]	Santa Cruz, Teneriffe	1,257
Ellen Little[2]	Descalabrados Pantelas, Porto Rico	1,251
Chaco[2]	Porto Militar, A.R.	3,966
Thor J[10]	Sandefjord, Norway	4,194
Harald[2]	Port of Spain, Trinidad	4,500

PHILADELPHIA

Narvik	Narvik	
Nordboen	Havana	
H. H. Barbour	St. John, N. B.	
F. A. Duggan*	Bahia	

BALTIMORE

Plymouth	Alexandria, Egypt	6,749
Tripoli	Leghorn, Italy	1,357
Claveresk	Felton, Cuba	6,100
Salvatori Ciampa	Savona, Italy	2,517
Orion	Genoa, Italy	4,390
George M. Grant	Barcelona, Spain	1,682
Mary W. Bowen	Marseilles, France	3,224

[1] Pocahontas Fuel Co. [2] Berwind-White Co.
[3] Castner Curran & Bullit. [4] Baker-Whiteley Co.
[5] Smokeless Fuel Co. [6] C. G. Blake Co. [7] C. & O. Coal & Coke Co. [8] C. H. Sprague & Son.
[9] Maryland Coal & Coke Co. [10] West Virginia Coal Co.
* Coal and coke.

COASTWISE FREIGHTS

While freights are still nominally at $2, Hampton Roads to Boston, actual charters of boats waiting at the loading piers have been made at $1.65 @1.75. The latter could be duplicated were there any demand at all for extra bottoms to load at Norfolk or Newport News. The owners of one steamer after canvassing the market for a coastwise coal charter finally engaged to take general cargo to Cuba. To Providence and New Bedford freights on 1,000- to 1,500-ton barges are about $1.50 for spot boats; $1.25@1.30 is still the range from New York to Long Island Sound ports, most of the chartering looking to get anthracite. To Penobscot points small schooners are still asking $2.50.

Lake Markets

BUFFALO

Confident predictions of still higher prices. Mines falling behind on contracts. Car and labor shortage restricting production. Shortage of vessels interferes with anthracite shipments.

Bituminous—The demand is about as uncertain as ever, but the supply is running short, so that the confident prophesies of high prices are continued. In some cases the advance asked is paid, but for the most part such quotations are merely an anouncement on the part of operators that they have no coal to sell, so they feel free to ask what they please. As a rule mines are all short of their contracts.

There is repetition of all former reports of shortage of cars and scarcity of men, with no prospect of improvement in that direction. The consumer is likely to wake up to the situation before long and then there will be high prices paid everywhere. The supply in the St. Lawrence Valley is running rather short and it is difficult to get the coal to the ports of Lake Ontario, so the all-rail route will have to supply that district mostly hereafter.

There is no change in the prices made by Pittsburgh for this market and Buffalo seldom pays an excess, but the trade further east is not so favorably situated. The continued shipment of coal from the Southwest helps this market, as it shades the Pittsburgh circular a few cents. Quotations are:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump.....	$2.95	$2.75	$3.00
Three-quarter.....	2.85	2.60	....
Mine run.....	2.75	2.50	2.80
Slack.....	2.40	2.30	2.80

Prices are per net ton, except east of Rochester and Kingston, Ont., where they are per gross ton.

Anthracite—Shippers are making every effort to meet the demand but there is no satisfying it. The Lake trade is suffering from a rush of all-rail movement and the local trade is increasing so fast that all retail dealers are clamoring for coal, with good prospect of getting only a small part of their orders filled in the near future. The consumer is already beginning to wonder why his coal does not come in promptly and he will soon be urging the dealer for more coal.

The shortage of coal is so great that the independent operators are putting up their prices fast. Till now a premium of 20c. or so was the rule, but jobbers are now reporting $1 on chestnut and 25c. on buckwheat. In this trade there is not so much complaint of car shortage as of scarcity of men and difficulties at the mines which cut down the production.

Shipments by Lake are only fair, the chief difficulty being a lack of tonnage. So many vessels are tied up with ore contracts that they cannot wait for coal. Shipments for the week were 68,660 net tons, of which 20,200 tons cleared for Milwaukee, 15,200 tons for Duluth and Superior, 14,100 tons for Chicago and 10,000 tons for Fort William. Contract rates are 35 to 50c. to Lake Michigan and 30c. to Lake Superior. Single charters are up to 75c. and $1 to Lake Michigan.

Following is the Buffalo price circular per gross ton, f.o.b. cars:

Grate.....	$5.85	Chestnut.....	$6.35
Stove.....	6.10	Pea.....	5.00
Egg.....	6.10	Buckwheat.....	3.50

A charge of 25c. additional is made for loading on Lake vessels.

PITTSBURGH

Heavy demand from outside advances prices sharply. Production fairly well maintained.

With a well sustained though not particularly heavy local demand there has been heavy demand for coal from outside quarters, chiefly for shipment East, and prices have been sent upward again, by 25c. or more. The demand from the East is insistent and suggests both that the buying is being done earlier than usual and that other districts are falling down under the demand upon them. There have been several sales of round tonnages for spot and prompt shipment at $2.25, this price being secured for both mine-run and ¾-in. There have been some small sales the past few days at $2 for mine-run, but it is claimed that the sellers were not alive to the situation and could have obtained higher prices. It is understood that some sales for delivery to the end of the year have been made at $2.25. A prominent steel company in the Buffalo district, usually well supplied by other means, is understood to have bought 5,000 tons of Pittsburgh district coal.

Slack is likewise bringing high prices, $1.75 as minimum with prices ranging up to $2 according to conditions. Predictions are made that slack will reach or pass the level of mine-run when the Lake shipping season closes as some consumers must have it and it is difficult at this time to install and operate crushing machinery.

Car supplies are poor and some production is being lost on this account but there is such pressure to produce coal that outputs are substantially normal. Labor supply is somewhat scant but no production is being lost on this account.

We quote: Slack, $1.75@2; mine-run, $2.10@2.25; ¾-in., $2.20@2.30; 1¼-in., $2.30@2.40, per net ton at mine, Pittsburgh district.

CLEVELAND

No price limit for spot shipments. Car shortage the worst ever experienced. Eastern and Western markets calling for coal. All-rail shipments to the Northwest increasing rapidly.

There is no price limit for spot coal shipments today. Prices have been jumping 25c. per ton every few days. The car shortage is one of the worst ever experienced and has come a full month earlier than usual. The labor shortage remains the same with no relief in sight. The demand for coal for all-rail shipment is increasing every day, with both Eastern and Western markets calling for coal at fancy prices.

Both Ann Arbor and Pere Marquette railroads report that their lake ferries are working to full capacity with all-rail coal for the Northwest, and are looking forward to a capacity business all winter. With the steel plants showing unusual activity, hardly 10 per cent. of the coal mined is going to Lake trade, and there is no question at all but what the Northwest will demand coal all winter.

All-rail shipments will increase from 20 to 30 per cent. when navigation closes and with a decrease of only 10 per cent., there will be no decrease in the price of coal.

Prices being asked today for shipments from the mines are $2 for three-quarter, $1.85 for mine-run, and straight slack is bringing $1.60. Local market prices are 10c. per ton higher, and show indications of going still higher.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8.....	$3.00	$2.90	$2.50
Cambridge.....	3.00	2.90	2.50
Middle Dist.....	2.90	2.80	2.40

No quotations are obtainable on Hocking, Youghiogheny, Pittsburgh, Pocahontas and Fairmont.

DETROIT

Demand for steam coal active with supply short. Domestic buyers find coal scarce. Lake movement slower.

Bituminous—Mines operating on short time owing to lack of labor and scarcity of railroad equipment restricting transportation has resulted in a considerable reduction in the supply of coal coming to Detroit. No actual shortage has developed, though it is impossible to obtain prompt delivery. Quotations on nut, pea and slack, which is in strongest demand, have advanced to $1.50 at the mines for Kentucky, West Virginia or Ohio coal. Mine-run is held at about the same basis and three-quarter lump is quoted at $2.

Users of domestic coal find trouble obtaining stock. Low temperature has created a broadening demand while the supply is limited. Hocking domestic lump brings about $2.50 at the mines and Jackson Hill is quoted at $2.75, though there is very little of either in the market. Prices on smokeless virtually represent an open market while almost no coal is to be had.

Anthracite—Orders for anthracite are being given more freely, while the supply is short. Some of the jobbers are demanding premiums for immediate delivery ranging from 40c. upward. Retail dealers in some instances are endeavoring to conserve their supplies to accommodate the greatest number of their customers by cutting down delivery on orders. Buyers ordering five tons are likely to receive only one or two tons at once. Car shortage and traffic congestion are holding back shipments from the East and embargoes on the Grand Trunk lines also check the free movement of coal from Buffalo.

Lake Trade—Mines are not shipping much coal to loading docks on Lake Erie and in consequence the movement up the Lakes shows considerable falling off. This has brought about a slackening demand for coal carriers and leaves very little coal to be handled by vessels that are not under season contract. Some of the recent charters of outside tonnage were made on the regular contract basis for cargoes going to Duluth and Superior or the Canadian head of the Lakes. Freight rates on shipments to Lake Michigan ports are maintained on about the same plane as heretofore. Cargoes are taken for swift unloading plants in Chicago or Milwaukee at about 75c., with a higher charge for ports where longer delay is necessitated in unloading.

TOLEDO

Tightest market ever experienced. No free coal available. Heavy Lake shipments.

The market here is said to be the highest in history and no quotations are available. Ohio mines are operating less than 60 per cent. capacity. An extremely large amount of coal is going up the Lakes and it is stated that more coal than ever has passed through the Toledo port this season.

Owing to the scarcity of supplies the Lake coal is being secured at the expense of the domestic market. Much blame is due to the dealers, who refused flatly to buy coal in the summer. The consequence is that the market has become a mere scramble for coal and prices are regulated by how bad the dealer wants it. Most contract coal is being delivered promptly, but there is a much greater demand in the open market than can be cared for by the supplies now in sight. The largest Pocahontas concern in the city is refusing all orders and delivering only contract coal.

COLUMBUS

The trade rules strong in every particular. Prices are still advancing and shipments are slow because of car shortage. Dealers and steam users are clamoring for fuel.

It is now a runaway market and prices are still soaring. All classes of users are anxious for coal and premiums are freely offered for immediate shipment. Dealers as well as large steam consumers have been caught with short stocks. Car shortage is increasing, and almost any price can be secured if the shipper has coal to furnish.

The domestic trade is probably feeling the pinch more than any other division of the business. Dealers, who were warned months ago to lay in a supply, refused because of labor shortage which made the unloading of cars a difficult task. Prices have now advanced from 50 to 75 per cent. and they are still having trouble with labor. Retail business is good in every way as householders are placing orders briskly. All retail prices are up 25c. over former levels. Anthracite is in good demand and prices are exceedingly stiff.

Steam business is also active and many of the users are clamoring for deliveries. Very few of the large users succeeded in accumulating a surplus and are operating on a hand-to-mouth basis. The car shortage is especially severe in the eastern Ohio field, reducing the output to below 50 per cent. of normal. There is also a shortage of cars in the Pomeroy Bend field and in West Virginia. The Hocking Valley Ry. is the best off, although shippers on that line are feeling the pressure. Railroads are still using a large tonnage for the movement of trains.

Lake trade continues active as there is a good demand from the head of the Lakes. The docks are generally free from congestion. Lake prices are ruling exceedingly strong.

Prices on short tons, f.o.b. mines, are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump	$2.35	$2.50	.....
Inch and a quarter	2.15	2.35	$2.00
Three-quarter inch	1.90	2.00	1.80
Nut	1.60	1.80	1.75
Egg	1.70	1.75	.....
Mine run	1.60	1.75	1.60
Nut, pea and slack	1.40	1.40	1.40
Coarse slack	1.30	1.30	1.30

CINCINNATI

Reduced production due to car and labor shortage continues to add strength to the market, buyers are bidding for coal and some anticipate an actual shortage.

With the supply of cars running between 50 and 60 per cent. as a maximum, at a time when the demand is normally heaviest, and with many mines unable to hold their men, the reduction in the output from West Virginia is becoming serious. There is a stronger demand than for several seasons, with less coal to supply it, and many buyers are getting into a panicky state of mind in consequence. Dealers and large steam consumers who are without adequate supplies behind them view with apprehension the probability of being unable to get coal later on as required, and their anxiety to stock up is reflected in the rising prices for all grades on this market. Increases in price to retail consumers have been announced by nearly all dealers, with further advances in prospect.

The continued demand caused by the undiminished volume of business at the Lake ports renders operators extremely independent, especially in view of their limited output, and buyers are bidding against each other for what coal is to be had. On the whole, the situation could not well be stronger, and as there is no immediate prospect of any change for the better as far as transportation is concerned, the advance of the season is bound to see a still more active demand and higher prices.

LOUISVILLE

Car shortage still the principal influence. Large contract buyers sending men to mines to insure shipping on contracts. Retail prices up. Industries uneasy.

A development of the week in the Kentucky field is arrival of representatives of large jobbers to watch mine deliveries on contracts. With open-market prices from 200 to 300 per cent. higher than contract figures, there is reported to be some disposition to neglect contract orders. Operators are doing what they can to force output on the days when cars are supplied in order to get higher ratings and larger allotment of cars, which are running about half requirements, with no prospects of an improvement.

In western Kentucky the Illinois Central has been calling for coal for its own use. There is practically no steam coal on the open market and the operators who make as good as 75 per cent. shipments on their contracts consider they are doing well. The demand is as yet anticipatory, although there has been a rush in Louisville for some weeks on the part of consumers. Prices have been advanced 25c. to 35c. a ton on the retail market, and there is no river coal left, comparatively speaking. Several months ago there was an almost unprecedented accumulation of domestic rail coal in Louisville, but failure of the river supply is equalizing the situation.

Prices may be quoted, f.o.b. mines, long-ton basis, at from $2.25 to $3 for eastern Kentucky block, the average around $2.50. Contract price on nut and slack is 70@75c., while on the open market, where sales are reported the price has frequently touched $2. Western Kentucky lump ranges $1.40@1.50, with no steam coals quoted on the open market.

BIRMINGHAM

Market exceedingly strong. Prices climb higher. Supply and movement restricted by shortage equipment.

The trade is featured by a heavy and insistent demand for all grades, with bookings light on account of the short supply of free coal. Quotations are changing daily and prices on both steam and domestic grades have advanced in the last week, from 10c. to 50c. per ton, and indications point to still higher prices.

We quote below per net ton, f.o.b. mines:

Cahaba mine-run	$1.75
Pratt mine-run	1.50
Big Seam mine-run	1.25
Carbon Hill mine-run	1.40@1.50
Montevallo lump	3.50
Cahaba lump	3.25@3.50
Carbon Hill lump	2.25@2.50
Black Creek lump	3.00@3.25

Contract deliveries in most instances are from two weeks to a month and a half in arrears. The car shortage is more acute than a week ago and the concensus of opinion is that a coal famine will ensue within the next few months unless the mines are supplied with more empties. There are no stocks anywhere and a continuous heavy movement is imperative.

Coke

CONNELLSVILLE

Market 25c. higher and strong. Several contracts for furnace coke for next year. Car supply practically sufficient, with labor supply very scant.

The coke market has been stiffening rapidly. All last week spot furnace coke was at $3.25 as minimum, as reported a week ago, but this week opened with sales at $3.50, an advance of 25c., while some operators have been quoting $3.65 and claim to have received the figure. There seems to be a definite shortage of spot coke, very few operators having any surplus to offer in the market, while there is a fair demand. Part of this demand is due to buying by consumers who are not covered by contract as they expected to have byproduct ovens completed by this time.

The contract furnace coke market has become active, with prices advancing. A week ago we reported a contract for first half at $3, but since then two contracts aggregating about 15,000 tons a month have been closed at $3.25, one for the first quarter and the other for first half. Incidentally a contract for a small tonnage for fourth quarter has been made at $3.35. The minimum quotation on contract is now $3.25 with some operators holding out for $3.50 and expecting to secure the price shortly. News just comes out that a few weeks ago two contracts were closed at considerably less than $3, for delivery over the whole year. Thus far considerably less than half the prospective buyers have either bought or definitely inquired for any part of next year.

There is occasional trouble from car shortage but in general there are adequate supplies, the condition differing sharply from that obtaining in the coal trade. Production is much below the oven capacity, as for some time past, the restriction being due almost wholly to labor shortage, although the demand for raw coal is an influence.

The market is now quotable as follows: Spot furnace, $3.50@3.65; contract, $3.25@3.50; spot foundry, $3.50@3.75; contract, $3.50@3.75, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Sept. 23 at 404,600 tons, an increase of 11,153 tons, and shipments at 418,428 tons, an increase of 22,121 tons.

Buffalo—The market grows firmer steadily. The fear seems to be that the facilities for manufacture and shipping will run very short. Shippers have made a further advance in practically all grades to $5.85 for best Connellsville foundry, $5.35 for standard furnace, $5.10 for high-sulphur furnace and $4.85 for stock coke.

Chicago—Coke shippers are still putting forth strenuous efforts to fill orders accepted during several weeks past, and are seeking no new orders. Nominal prices per net ton, f.o.b. cars Chicago, are as follows:

Connellsville	$6.00@6.25
Wise County	6.00@6.25
Byproduct foundry	6.00@6.25
Byproduct domestic	5.00@5.50
Gas house	4.75@4.85

Birmingham—Little free coke, either foundry or furnace, is to be had. Sales of spot foundry have been made at $5@5 25 during the last few days. Inquiries were received from Japan for 5,000 tons and from Italy for 10,000 tons, which could not be entertained. Furnace coke is quoted at $3.35@3.50 at the ovens.

Middle Western

GENERAL REVIEW

Prices soaring higher and abnormal market conditions prevail. Free tonnage increasingly scarce. All grades in a strong position. Retailers poorly prepared for winter seasons.

Following a week of unusual activity the Western markets have become tight with offerings of free coal very scarce and shippers not urging further domestic buying. Operators and wholesalers are laboring under an avalanche of orders which should have been placed months ago. The tonnage moving is largely applied against contracts, so that free coal yields abnormal prices. No difficulty is found in maintaining prices at maximum schedules on all grades and many sales are made at premiums. Free coal is bound to show still further advances.

Steam prices show no material changes, although screenings are inclined to be stronger. Some southern Illinois operators have quoted prices as high as $3 per ton on domestic sizes, and it is rumored that schedules on Indiana and Illinois coarse grades will shortly be increased 25c. to 50c. per ton. Large consumers of steam coals in the West are well protected by contracts made in mid-summer at generally higher prices than those which prevailed last season, and are obtaining a fair amount of tonnage under these contracts, so that most of them view the situation with equanimity. Most of the large utility companies and industrial plants have plenty of reserve stocks at this time, but the smaller steam

plants are paying the penalty of procrastination even on the small tonnage they are now able to obtain.

Outbound shipments from Lake ports are heavy, and country demand in the Northwest shows no abatement. Retailers in the Northwestern interior are said to be in much better shape than elsewhere in the matter of stocks. Great quantities of coal are coming up the Lakes, and some predict that the apparent statistical shortage of one million tons will be made up before the close of navigation. All-rail trade for Indiana and Illinois coals in the Northwest shows considerable expansion. Illinois grades are reaching points in the Northwest which have never been opened to them before.

Owing to scarcity of free coal, no fixed prices prevail on tonnage of this character. Quotations are made only for immediate acceptance, and what is considered a top price one day is replaced by still higher quotation the next day. Western retailers are sadly short of stocks, and their shipping connections do not seem to be able to speed up production.

While the short car supply is most generally under discussion at the present time, many believe that lack of labor is going to play the most important part in the situation later. Shipments are heavier than ever before in the history of the Western coal trade, notably of coarse sizes. New developments are projected in nearly every mining section, and the Western coal industry has never received such a stimulus as during the last four months.

CHICAGO

Speculative prices prevail for free shipments, output of mines being mostly shipped against contracts. Screenings show firm tone. Anthracite and smokeless extremely scarce.

Franklin County operators are fully sold up on all sizes, and in some instances are over a month behind in filling orders. Steam plants are buying considerable quantities of steam lump and mine-run from southern Illinois. Screenings are much firmer, averaging $1 per ton. Operating time is about 65% of capacity owing to lack of cars. All operators in Williamson and Saline County are oversold. A circular price of $2.25 on lump, egg and nut has been issued, and shippers are obtaining this price easily. The Franklin and Williamson County operators are adhering firmly to the circular price of $2 on lump, egg and No. 1 nut, although it would be easy for them to secure $2.25 to $2.35 if any free coal was available. The situation is that while the operators have named a circular they have no tonnage to sell.

The output of Indiana mines is equal to about two-thirds of the demand, and the carriers are only supplying the mines with sufficient cars to operate about four days per week. No free coal is shipped, all shipments being sold in advance. Domestic consumers of Indiana coal in Chicago have delayed putting in their winter supplies and retailers are now urging rush deliveries at the higher quotations prevailing. No. 4 domestic lump advanced this week to $2 per ton, and No. 5 and 6 domestic sizes are averaging $1.85.

Various quotations exist on smokeless coals, mine-run averaging from $2 to $2.35, with here and there quotations reported as high as $2.50 to $2.75. Lump and egg tonnage is quite scarce, some open shipments having been sold as high as $3 during the week. A serious shortage of cars exists at the smokeless mines, and very little coal is for sale. Every mail brings letters and requests from all quarters urging shipments.

It is freely predicted that if the heavy movement of anthracite continues from Chicago docks the supply of certain sizes will have entirely disappeared in another week. All-rail shipments are very scarce, and the Lake movement has been much less than anticipated recently, most of the anthracite tonnage going to the head of the Lakes. Retailers have advanced their prices to the domestic consumer, and wholesale prices are firmly held to circular, in many cases a premium being exacted for immediate deliveries.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars mines:

	Wilms. and Frank. Cos.	Springfield	Sullivan Co.	Clinton	Green and Knox Cos.
Lump	$2.00	$2.00	$1.75@1.90	$2.00	$2.00
Steam lump	.....	1.35@1.45	1.50@1.60	1.50	1.40@1.50
2½ and 3-in. lump	.....	.....	1.60@1.70	1.65@1.75	1.65
1¼-in. lump	.....	.....	1.50	1.45@1.50	.....
Egg	2.00	2.00	1.60@1.75	1.75@1.80	1.90
Nut	....	1.75@1.85	1.40@1.55	1.50@1.65	1.60@1.65
No. 1 washed	2.00	.....	.....	.....	.....
No. 2 washed	1.75@1.85	.....	.....	.....	.....
No. 1 nut	2.00	.....	.....	.....	.....
No. 2 nut	1.75@1.85	.....	.....	.....	.....
Mine-run	1.25@1.35	1.25@1.35	1.25@1.35	1.25@1.30	1.30@1.35
Screenings	1.00@1.05	.90@ .95	1.00@1.05	1.00@1.15	1.00

	Saline and Harrisburg	E. Kentucky	Pocah. and W. Va. Smokl.	Penn. Smokeless
Lump	$2.00	$2.25@2.65	$2.25@3.00	$2.40@3.00
1½-in. lump	1.50	.....	.....	.....
Egg	2.00	2.15@2.50	2.25@3.00	2.40@2.65
Nut	2.00	2.00@2.30	1.80@2.35	2.00
No. 1 washed	2.00	.....	.....	.....
No. 2 washed	1.75	.....	.....	.....
Mine-run	1.35	1.30@1.35	2.00@2.35	2.00@2.25
Screenings	1.00	.....	.....	.....

Hocking domestic lump, $2.40@2.50. Kanawha splint lump, $2.25.

ST. LOUIS

Orders far in excess of production. Consumers willing to take any grades. Indications of a runaway market.

The market this week has been on the jump. About three times as many orders have been received as the production could take care of and prices on all sizes have been advancing rapidly.

The Standard market is a great deal higher as all prices on domestic coal have advanced a great deal during the week. The wide differences between the higher and lower grades in the Standard district have been leveled up and everyone is asking practically the same price now. Standard screenings are considerably better than they were last week, there being practically nothing on hand now at the mines whereas a week ago there was quite an accumulation. Prices softened up a little last week but are beginning to stiffen again.

The Franklin district is sold out for at least a month. Their nominal quotation is still $2 per ton, although the Ziegler people have raised their price to $2.25. The chances are the other operators will follow and the price may go to $2.50 or $2.75.

In Williamson County prices are being quoted firmly at $2, and the whole county is practically oversold for a month.

It looks as if the whole market on any grade is about $2 per ton at the mine at the present time, the question simply being one of getting shipment. There is a mild panic for coal now and it is getting worse. It is hard to tell where prices will stop in October.

Springfield domestic lump has now reached the $2 mark in a new circular recently issued; screenings are averaging 95c. per ton. Central Illinois steam coals are in much stronger position than last week. Shortage of cars at the central Illinois mines has been acute.

Anthracite is off the market entirely and it is impossible to place an order for shipment under several months. There is scarcely a company that will accept an order at all. It is rumored that a premium of $1 per tan is being offered for anthracite coal by jobbers but there seems to be none forthcoming even at that price.

The market is quotable on the following basis per net ton, f.o.b. mines:

	Franklin County	W'mson	Staun. and Mont.	Standard
6-in. lump	$2.00	$2.00	$1.85	$1.75
6x3-in. egg	2.00	2.00	1.85	1.75
3x2-in. nut	2.00	2.00	1.85	1.75
No. 2 nut	1.75	1.75	1.60	.....
No. 3 nut	1.60	.....	.....	.....
No. 4 nut	1.30	.....	.....	.....
No. 5 nut	.75	.....	.....	.....
Screenings	1.00	.90	.90	.95
2-in. lump	.....	.....	.....	.....
Steam egg	.....	.....	.....	.....
Mine-run	1.40	1.30	1.25	1.20
Washed	.....	.....	.....	.....
No. 1 nut	.....	2.00	1.85	1.75
No. 2 nut	.....	1.75	1.70	1.60
No. 3 nut	.....	1.50	1.40	1.40
No. 4 pea	.....	1.30	1.30	1.25
No. 5 slack	.....	.75	.75	.75

General Statistics

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts in August and for the 2 months ending August for years 1915 and 1916, in short tons:

	August				2 Months			
Destination	1916	%	1915	%	1916	%	1915	%
Tidewater	500,906	22	504,491	22	928,318	20	988,980	23
East	200,588	8	198,045	9	376,640	8	352,663	8
West	1,401,785	59	1,378,070	62	2,890,785	63	2,611,320	61
Total	2,103,279		2,080,606		4,195,743		3,952,973	
From Connections								
Bituminous	233,069	11	156,019	7	405,909	9	338,308	8
Anthra. (local)	191	...	138	...	335	...	138	...
Anthracite	1,550	...	1,669	...	2,980	...	2,988	...
Total	2,328,089	100	2,238,432	100	4,604,967	100	4,294,407	100
Co. fuel	168,381		157,996		303,550		310,026	
Total	2,496,470		2,396,428		4,908,517		4,604,433	
Coke	43,614		25,010		79,366		46,970	

Foreign Markets

GREAT BRITAIN

Sept. 20—There has been no change worthy of note in the coal market since last report. Coal is still scarce and dear, prices remaining at about last week's level.

Best Welsh steam	Nominal
Best seconds	Nominal
Seconds	$11.28@11.52
Best dry coals	10.20@10.80
Best Monmouthshires	11.28@11.52
Seconds	10.56@10.80
Best Cardiff smalls	7.20@ 7.80
Cargo smalls	5.40@ 6.00

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—The freight market continues to be inactive, rates ruling at about last week's level.

Gibraltar	$6.24	Port Said	$13.80
Genoa	14.40	Las Palmas	6.60
Naples	14.40	St. Vincent	7.20
Alexandria	14.40	River Plate	7.50

Exports—British exports for August and the eight months of the past two years were as follows:

	August		Eight Months	
To	1915	1916	1915	1916
Russia	5,923	.....	35,495	4,804
Sweden	135,875	161,280	1,895,325	1,120,394
Norway	269,812	209,667	1,872,214	1,664,105
Denmark	320,754	223,741	2,231,186	1,623,243
Netherl.	212,381	132,466	1,154,243	812,575
France	1,542,530	1,614,444	11,537,001	11,577,282
Portugal[1]	71,117	41,058	690,656	604,128
Spain[4]	142,531	169,905	1,033,147	1,178,336
Canary	26,269	20,476	362,930	319,531
Italy	419,310	535,579	3,844,360	3,815,194
Greece	9,819	18,242	273,198	110,847
Turkey	3,767	3,219	10,324	3,219
Algeria	56,083	52,356	634,588	522,921
Portugal[5]	8,681	15,115	145,017	174,784
Chile	2,611	134	38,384	17,706
Brazil	52,429	2,037	412,331	168,328
Uruguay	19,124	1,048	230,238	156,690
Argentina	130,576	30,302	1,156,992	608,280
Channel Is.	12,998	20,524	85,620	81,561
Gibraltar	39,769	36,018	242,095	329,540
Malta	9,230	5,352	108,567	42,221
Egypt[2]	140,462	86,632	944,435	547,127
Aden[3]	.....	3,611	105,794	9,643
India	5	50	18,080	8,886
Ceylon	.....	2,223	38,730	22,766
Miscell.	24,416	34,140	421,229	335,085
Coke	89,574	138,264	576,218	1,019,896
Briquettes	113,748	107,599	864,503	925,213
Total	3,853,794	3,665,482	30,962,900	27,744,306
Bunker	1,158,729	1,168,299	9,657,927	8,758,199

[1] Includes Azores and Madeira. [2] Including Anglo-Egyptian Sudan. [3] And dependencies. [4] And Canaries. [5] West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.

SPAIN

Spanish imports for the 6 months to June 30 compare as follows:

	1915	1916
Coal	756,396	857,017
Coke	94,212	86,652